2019 Joint MMM-Intermag Conference

January 14-18, 2019
Washington, DC

PROGRAM

Marriott Wardman Park
www.magnetism.org

AIP Publishing
IEEE MAGNETICS

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GENERAL CONFERENCE INFORMATION

SCOPE OF THE CONFERENCE

The 14th Joint MMM-Intermag Conference (2019 Joint) is sponsored jointly by AIP Publishing and the IEEE Magnetics Society, in cooperation with the American Physical Society. Members of the international scientific and engineering communities interested in recent developments in fundamental and applied magnetism are invited to attend and contribute to the technical sessions. The technical program will include invited and contributed papers in oral and poster sessions, invited symposia, a plenary session, and an evening session, with about 1500 presentations overall. This Conference provides an outstanding opportunity for worldwide participants to meet their colleagues and collaborators and discuss developments in all areas of magnetism research.

WASHINGTON, DC

Welcome to Washington, DC, the Nation's Capital! DC is a fantastic place to visit—you'll want to extend your stay to see it all! With over 100+ free things to do, world-class restaurants around every corner, more museums than you could visit in a month, gorgeous historical homes and buildings, live theater and music, both city and Capitol tours, shopping, and more, you will never be bored. From the White House and the Washington Monument, to the International Spy Museum and the National Zoo, to the new Wharf on the Southwest Waterfront, you'll fill your days (and nights) with exciting sights and adventures. Go to www.washington.org for more information.

HOTEL

All Conference sessions will be held at the Wardman Park Marriott Hotel, in the beautiful Woodley Park neighborhood of northwest DC, close to Embassy Row, Rock Creek Park, Dupont Circle, the National Zoo, and lots of restaurants. The hotel is conveniently located at the Woodley Park/Zoo/Adams Morgan stop on the Metro's Red Line, making your trip to and from the airport, and in and around town, a breeze.

A block of discounted hotel rooms has been reserved for attendees at the Marriott. Please support our efforts to keep registration fees low by booking your room here. Discounted rates are available until December 21 at www.magnetism.org under "Travel Guide/Hotel Information".

SPECIAL CONFERENCE SESSIONS

Tutorial: Foundational Methods for Understanding Magnetic Materials

Monday, January 14 2:30 - 5:00 pm
Salon 2

Co-Chairs: Laura H. Lewis, *Northeastern University*
2019 Joint Conference Program Co-Chair

Steve May, *Drexel University*
2019 Joint Conference Program Co-Chair

Magnetometry—the Good, the Bad and the Ugly
Plamen Stamenov, *Trinity College Dublin*

Computational Methods in Magnetism: From First Principles to Magnetization Dynamics
Claudia Mewes, *University of Alabama*

Ferromagnetic Resonance
Mingzhong Wu, *Colorado State University*

Symposia

There will be eight symposia during the Conference which consist entirely of invited talks by experts in the field.

Tuesday 8:30 am	**AA**	Spin-transport in Insulators: From Transport in Ferromagnets to Unconventional Magnonics in Antiferromagnets
Tuesday 1:30 pm	**BA**	Magnetic Nanoparticles and Nanograins for Biosensing and Magnetic Recording
Wednesday 8:30 am	**CA**	Switching Antiferromagnets by Spin-orbit Torques
Thursday 8:30 am	**EA**	3D Magnetic Frustration: Pyrochlore, Spinel and FCC Lattices
	EB	Magnetism for the Brain: Challenges and Solutions
Thursday 1:30 pm	**FA**	Voltage Control of Nanomagnetism
Friday 8:30 am	**GA**	Energy Harvesting and Transformations Based on Magnetic Materials
Friday 1:30 pm	**HA**	Magnetism Research Using X-ray Free Electron Lasers

Young Professionals Panel Session

Tuesday, January 15 12:30 - 1:30 pm
Wilson AB

Chair: Ikenna Nlebedim, *Iowa State University*

Panelists: Jun Cui, *Iowa State University*

Randy Dumas, *Quantum Design*

Olga Kazakova, *National Physical Laboratory*

Melissa Patterson, *AIP Publishing*

If you have just recently entered the professional workforce, please join us for a special panel session focused on **"Navigating Career Domain Walls as Young Professionals in Magnetism"**, sponsored by the IEEE Magnetics Society. Lunch will be provided at no extra cost to attendees. **Space is limited so advance registration is required.**

Meet the Experts Panel Session

Supported by:

evicomagnetics

Tuesday, January 15 6:00 - 7:30 pm
Maryland

Co-Chairs: Laura H. Lewis, *Northeastern University*
2019 Joint Conference Program Co-Chair

Steve May, *Drexel University*
2019 Joint Conference Program Co-Chair

Panelists: Johan Åkerman
Professor of Physics, University of Gothenburg

Meigan Aronson
Dean of Science, University of British Columbia

Gang Chen
Professor of Physics, Fudan University

Shikha Jain
Principal Research Engineer, Western Digital

June Lau
Staff Physicist, NIST

Chris Leighton
Distinguished McKnight University Professor,
University of Minnesota
Editor, Physical Review Materials

Students and post-doctoral researchers are invited to attend the Meet the Experts Panel Session to be held on Tuesday evening, followed by a networking reception. This event provides young researchers with an exclusive opportunity to hear from a panel of six experts from different fields for advice on career planning, technical paper writing and publication, job searches and interviews, society involvement, and more. **Space is limited so advance registration is required.**

Communications Workshop

Wednesday, January 16 12:30 - 1:30 pm
Wilson AB

Co-Chairs: Laura H. Lewis, *Northeastern University*
2019 Joint Conference Program Co-Chair

Steve May, *Drexel University*
2019 Joint Conference Program Co-Chair

Evidence-Based Strategies for Communicating Your Science
Dr. Rose Hendricks, *Researcher, FrameWorks Institute*

No skill contributes more consistently, and more meaningfully, to professional achievement than the ability to shape thinking and secure support through communication. In this event, sponsored by the IEEE Magnetics Society, recommendations for communicating science in an accessible and engaging way, will be provided. These recommendations, based in qualitative and quantitative social science research, will help audience members communicate their own work more effectively to other scientists as well as to members of the public. To that end, particular emphasis will be placed on tailoring scientific communications to various audiences. These recommendations are provided by the FrameWorks Institute, a nonprofit organization that conducts research to help the nonprofit sector better communicate about scientific and social issues. Lunch will be provided at no extra cost to attendees. **Space is limited so advance registration is required.**

Plenary Session

Wednesday, January 16 4:30 - 6:30 pm
Salons 2 & 3

Welcome

Pallavi Dhagat, *Oregon State University*
IEEE Magnetics Society President

Awards Presentation by the IEEE Magnetics Society

Jürgen Fassbender, *Helmholtz-Zentrum Dresden - Rossendorf*
IEEE Magnetics Society Honors and Awards Committee Chair

Congratulations to the Achievement Award Winner:

Bernard Dieny, *Spintec*

For contributions to spintronics applications including spin-valves and MRAMs and for strengthening the relationship between magnetics and microelectronic communities.

Congratulations to the Distinguished Service Award Winner:

David Jiles, *Iowa State University*

For twenty years of leadership in the Magnetics Society as Editor and Editor-in-Chief of IEEE Transactions on Magnetics and as an elected member of the Administrative Committee.

Awards and recognition will also be given to the Best Student Presentation Finalists, IEEE Fellows, Distinguished Lecturers, Magnetism as Art Finalists, Student Travel Grant Recipients and others.

Plenary Talk

Chair: Suzanne te Velthuis, *Argonne National Laboratory*
2019 Joint Conference General Chair

Quantum Magnetism: An Unfinished Revolution
Meigan Aronson, *Dean of Science,*
University of British Columbia

Meigan Aronson is Dean of the Faculty of Science at the University of British Columbia, where she is also Professor of Physics and Astronomy. Previously she served as Dean of Science at Texas A&M University (2015-2018), and as Professor of Physics and Astronomy at Stony Brook University while concurrently leading the correlated electron materials group in the Condensed Matter Physics and Materials Science Department at Brookhaven National Laboratory (2007-2015). Her research interests include correlated electron materials and the discovery and characterization of quantum materials. Aronson has an extensive publication record, and has been honored with a number of fellowships, including from the American Physical Society and the Neutron Scattering Society of America. Among her many professional activities, she is the current chair of the Oak Ridge National Laboratory Neutron Advisory Board and the National High Magnetic Field Laboratory External Advisory Committee. In addition, Aronson has been a member of several advisory committees for the National Academy Board on Physics and Astronomy. Recently, she served as a panel lead for the US Department of Energy Basic Research Needs Workshop on Quantum Materials for Energy Relevant Technology.

Smithsonian National Zoo Lecture

Thursday, January 17 12:00 - 1:00 pm
Maryland

Co-Chairs: Laura H. Lewis, *Northeastern University*
2019 Joint Conference Program Co-Chair

Steve May, *Drexel University*
2019 Joint Conference Program Co-Chair

How Do Animals Navigate Long-Distance Migrations and What is the Role of the Earth's Magnetic Field?
Dr. Emily Cohen, *Research Ecologist,*
Migratory Bird Center, Smithsonian
Conservation Biology Institute

Join us as Dr. Emily Cohen reviews the phenomena and diversity of long-distance animal migrations and what we know about the mechanisms animals use to navigate during these journeys with a particular focus on magnetoreception and birds.

Evening Session

Thursday, January 17 6:00 - 7:30 pm
Salon 2

Co-Chairs: Laura H. Lewis, *Northeastern University*
2019 Joint Conference Program Co-Chair

Steve May, *Drexel University*
2019 Joint Conference Program Co-Chair

2D Magnets and Heterostructures
Xiaodong Xu, *University of Washington*

Xiaodong Xu is a Boeing Distinguished Professor in the Department of Physics and the Department of Materials Science and Engineering at the University of Washington. He received his PhD (Physics, 2008) from the University of Michigan and then performed postdoctoral research (2009-2010) at the Center for Nanoscale Systems at Cornell University. His nanoscale quantum optoelectronics group at University of Washington focuses on creation, control, and understanding of novel device physics based on two-dimensional quantum materials. Selected awards include DAPRA YFA, NSF Early Career Award, DoE Early Career Award, Cottrell Scholar Award, and IUPAP Young Scientist Prize in Semiconductor Physics.

What Will We Make Magnets From?
Alexander King, *Iowa State University*

Alexander King is the founding and former Director of the U.S. Department of Energy's Critical Materials Institute—one of DOE's four Energy Innovation Hubs established to accelerate scientific discovery of critical energy technologies. King was also Director of DOE's Ames Laboratory (2008-2013) and was Head of the School of Materials Engineering at Purdue University from 1999 to 2007. A native Londoner, King is a Fellow of the Institute of Mining Minerals and Materials, ASM International, and the Materials Research Society. He was also a Visiting Fellow of the Japan Society for the Promotion of Science in 1996, President of the Materials Research Society (MRS) for 2002, U.S. Department of State Jefferson Science Fellow for 2005-06. King's most recent work, highlighted in a 2013 TEDx talk and as the 2017 TMS & ASM Distinguished Lecturer on Materials and Society, focuses on understanding the dynamics of materials supply-chain failures and implementing effective strategies to avoid or alleviate them.

SPECIAL CONFERENCE EVENTS

Magnetism as Art Showcase

Supported by:

AIP | Advances

The 2019 Joint Conference will host a Magnetism as Art Showcase, to highlight the beauty of magnetism and magnetic materials. Selected submissions will be displayed at the Conference and all submissions will be posted to the Conference Facebook page. Four finalists will be determined by popular vote and of those finalists, one winner will be selected by a panel of local Washington, DC art experts. Finalists will receive a $200 cash prize, and the winner will receive a $400 cash prize, presented at the Plenary Session on Wednesday. **Don't forget to take a look at the selected submissions on display and vote for your favorite! Submit your ballot by 12:30 pm on Wednesday, January 16.**

IEEE Magnetics Society Annual Meeting

Tuesday, January 15 4:30 - 5:15 pm
Washington 4

This meeting is open to all Joint Conference participants, and food and drinks will be served. Come to learn more about what the IEEE Magnetics Society is doing to support and strengthen the magnetics community, and about the benefits of belonging to the Society. Your suggestions and feedback are most welcome.

By joining the IEEE Magnetics Society, you become part of the world's best-known magnetics organization. In addition to discounts on Conference registrations, such as the 2019 MMM Conference, you will gain access to local Chapter events and technical activities. To join, go to www.ieeemagnetics.org. If you would like to use your IEEE Magnetics Society membership to qualify for the registration discount, you must join ***before you register*** for the 2019 MMM Conference.

Women in Magnetism Networking Reception

Tuesday, January 15 4:30 - 6:00 pm
Stone's Throw Restaurant

Expand your professional network! Don't miss the Women in Magnetism Networking Reception, sponsored by the IEEE Magnetics Society. This is an opportunity to become acquainted with women in the profession and to discuss a range of topics including leadership, work-life balance, and professional development. All students, researchers and retirees are encouraged to attend.

Plenary Reception—Welcome to Embassy Row

Wednesday, January 16 6:30 - 8:00 pm
Salon 1 and Marriott Foyer

Immediately following the Plenary Session on Wednesday, Conference attendees are invited to attend a Plenary Reception. Join us for a taste of the international flavors of Embassy Row in Washington, DC. And, of course, there will be a great selection of local beers and wines, sponsored by the IEEE Magnetics Society. Don't miss this uniquely DC event!

Student Networking Reception and Next Generation Magneticians Science Slam

Thursday, January 17 4:30 - 6:00 pm
Wilson

The Student Networking Reception, sponsored by the IEEE Magnetics Society, is a fun networking event open to all current student registrants. Come for the food and drinks and stay for the friends, old and new.

This reception will be held concurrently with, and right next door to, the Next Generation Magneticians Science Slam. Present your work in a different way! Join us for this innovative and funny event, full of emotion and creativity to introduce your scientific research from a new angle, a new perspective. This is not your boring weekly seminar! Recite, rap, sing, make a photographic design, screen a video, dance: we leave it to your discretion and creativity. Just let us know about your performance by December 1 so that we can accommodate your needs. Email ScienceSlamINTERMAG@gmail.com to submit your idea.

Bierstuben

Join us Monday 5:00 - 6:30 pm and Tuesday and Thursday from 4:30 - 6:00 pm for a taste of the best local beers as you network among the poster sessions and exhibits.

Tuesday Bierstube supported by:

MATERION

Coffee

Complimentary coffee service will be available Tuesday through Friday mornings from 8:15 - 9:45 am in the Exhibit/Poster Hall.

Tuesday coffee break supported by:

OXFORD UNIVERSITY PRESS

REGISTRATION

Registration Hours:

Monday	12:30 pm - 6:30 pm
Tuesday	7:00 am - 7:00 pm
Wednesday	8:00 am - 7:00 pm
Thursday	8:00 am - 2:00 pm
Friday	8:00 am - 1:30 pm

Onsite Registration Rates:

IEEE, AIP Society, or AIP Affiliated Society Member

Full	$725
Student	$270
Retiree	$330
Life Member	$225

Non-member

Full	$870
Student	$325
Retiree	$400

CAMERA, CELL PHONE AND VIDEO RECORDING POLICIES

By registering for this meeting, all attendees acknowledge that they may be photographed by Conference personnel while at events, and that those photos may be used for promotional purposes, in Conference publications and websites, and on social media sites. Any recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright is strictly prohibited. Attendees violating this policy may be asked to leave the session.

NAME BADGE POLICY

Attendees are required to wear name badges to enter all Conference events.

PRIVACY POLICY

By registering for the 2019 Joint Conference, you agree to receive emails related to this Conference for a period up to three months after the Conference concludes. Your personal information is for Conference use only and will not be shared with anyone else. During the registration process, you will also have the option to join the mailing list for future Joint, MMM, Intermag and ICM Conferences. If you do not select this option, you will not receive any emails for future Conferences. You can modify your email preferences at any time by contacting us at info@mmmconference.com.

CODE OF CONDUCT

The objective of the Conference organizers is to create a collegial, inclusive, and professional environment at the Conference in order to facilitate and support open scientific discourse and advance knowledge in the field of magnetism. Creating this environment is the responsibility of all participants, including attendees, speakers, vendors, exhibitors, Conference management staff and organizers. It is the policy of the Conference that all meeting and Conference participants will conduct themselves in a professional manner that is welcoming and free from any form of bias, discrimination, harassment, or retaliation.

Accordingly, participants are required to treat each other with respect and consideration and avoid any actions or statements based on individual characteristics such as age, ancestry, color, disability or handicap, national origin, race, religion, gender, sexual or affectional orientation, gender identity, gender expression, appearance, matriculation, political affiliation, marital status, veteran status, or any other characteristic protected by law. Discriminatory or harassing behavior of any kind will not be tolerated. Harassment includes but is not limited to inappropriate or intimidating behavior and language, unwelcome jokes or comments, unwanted touching or attention, offensive images, and stalking.

Violations of this policy, or those additionally referred to in the IEEE Code of Conduct, should be reported to the Conference organizers, management staff, or to the IEEE Magnetics Society President. Sanctions may range from verbal or written warning, to ejection from the meeting without refund. Retaliation for complaints of inappropriate conduct will not be tolerated.

WIRELESS INTERNET ACCESS

Supported by:

APS physics

Wi-Fi for attendees is jointly supported by the American Physical Society and the IEEE Magnetics Society.

Network: APS_PhysicalReview
Password: PRMaterials

SESSION CHAIRS

Poster and Oral Session Chairs should attend the Session Chair Breakfast at 7:15 am in Washington 4 (Exhibit Level) **on the day of their session**. Timer slides will be pre-loaded on the session laptops in each oral session room, however, Session Chairs should bring their laptop to be used as a backup for presentations if needed.

SPEAKER REHEARSAL ROOM

Presenters are encouraged to use the Speaker Rehearsal Room in Room 8222 to practice their presentations with the provided audio-visual equipment (LCD projector and screen). This room is available from Monday at 1:00 pm until Friday at 1:00 pm.

PUBLICATIONS

Peer-reviewed Conference papers will be published online in late 2019 as special issues of *AIP Advances* and the IEEE *Transactions on Magnetics* (TMAG). Entire sessions will be assigned to one of these journals by the Publication Co-Chairs. Invited papers will be published in the Journal to which their session is assigned. All accepted papers are identified by presentation ID. All *AIP Advances* papers will be open access at no additional cost to the authors.

To check the status of their papers, authors should refer to the AIP submission site at http://mmm.peerx-press.org or the IEEE submission site at https://mc.manuscriptcentral.com/transmag-ieee. For all other publication questions, visit the Conference Office in Room 8226.

ORAL SESSIONS

Nine simultaneous oral sessions will be held daily from 8:30 - 11:30 am and 1:30 - 4:30 pm. The Wednesday afternoon sessions will be held from 1:30 - 3:18 pm to accommodate the Plenary Session.

Speakers must bring their presentation on their own laptop computer. If you are unable to bring a laptop for any reason, presenters should alert their Session Chair and arrange to share their presentation by email.

In each session room there will be a multi-port switchbox so that speakers can connect their laptop during the question period of the previous speaker. Each speaker will be responsible for promptly connecting to the projector and switching to the correct input port. **The presentation timer will begin immediately after the introduction by the Session Chair. No extra time will be given in the event of technical difficulties as session timing must be strictly maintained to allow attendees to attend talks in multiple parallel symposia.** Speakers are strongly encouraged to test their laptop connections and screen resolution settings in the Speaker Rehearsal Room prior to the start of the session.

There will be a dedicated audio-visual technician in each oral session room to assist presenters as needed.

BEST STUDENT PRESENTATION AWARD

The Best Student Presentation competition, sponsored by the IEEE Magnetics Society, recognizes and encourages excellence in graduate studies in the field of magnetism. There will be a $1000 one-year fellowship for the winner and $250 one-year fellowship for the remaining finalists, who will be announced at the Presentation of Awards during the Plenary Session on Wednesday afternoon. Conference attendees are encouraged to attend the finalists' talks and support these young scientists.

Finalists:

AB-07 **Spin-Orbit Torque and Nernst Effects in Bi_xSb_{1-x}/ Ferromagnet Heterostructures**
Niklas Roschewsky, *University of California, Berkeley*

AG-11	**Large MR Ratio by Using Metastable bcc-Cu Spacer Layer in Epitaxial Current In-Plane Giant Magnetoresistance Devices** Kresna B. Fathoni, *National Institute for Materials Science and University of Tsukuba*
BC-01	**Controlling the Profile, Stability and Dynamics of Chiral Hybrid Skyrmions** William Legrand, *Université Paris-Saclay*
CE-03	**Single Domain Magnetoelastic Terfenol-D Microdisks for Particle and Cell Manipulation** Zhuyun Xiao, *University of California, Los Angeles*
CB-09	**Electric-field Control of Spin Accumulation Direction in a Spin-orbit Torque Device** Rahul Mishra, *National University of Singapore*

Congratulations to the Best Student Presentation Award Winner at the 2017 MMM Conference:

BE-02	***Enhancement of $L2_1$ Order and Spin-Polarization of Co_2FeSi Thin Film by Substitution of Fe with Ti*** Jiamin Chen, *University of Tsukuba*

Congratulations to the Best Student Presentation Award Winner at the 2018 Intermag Conference:

AI-11	***Mutually Synchronized 2D Spin Hall Nano-oscillator Arrays*** Mohammad Zahedinejad, *University of Gothenburg*

IEEE SUMMER SCHOOL ON MAGNETICS POSTERS

Posters describing projects designed and executed by two student groups from the 2018 IEEE Magnetics Society Summer School held in Quito, Ecuador, will be on display with the 2019 Joint Conference Best Poster Award Winners outside the Exhibit Hall.

DN-06	**Magnetic Combination Therapy: A New, Drug-free Approach to Cancer Treatment** Irati Rodrigo Arrizabalaga, Michael Stanton, Daniela Valdés, and Emma P. Welbourne
BO-02	**A Comparison of Dzyaloshinskii-Moriya Interaction Detection Techniques in Pt/Co/Ir Multilayers** Katherin Nygren, Jeffrey Brock, Domenichini Pablo, Anni Cao, Avinash Kumar Chaurasiya, and Pierre Vallobra

POSTER SESSIONS

Poster Sessions will be held daily from 9:30 am - 12:30 pm and 2:30 - 5:30 pm. On Friday there will only be a morning Poster Session.

Poster presenters should set up their materials at least 30 minutes before their session starts, and must be present at their poster, at a minimum, for the first *and* last hour of each Poster Session. Presenters must remove all of their materials promptly at the end of their session. Any poster materials not removed will be discarded.

BEST POSTER PRESENTATION AWARD

Supported by:

GMW

All posters will be eligible for nomination for this award. Additionally, it is required that an author be registered for the Conference and be present during the entire 3-hour poster session to present details and answer questions. Nominations will be made by the Poster Session Chairs. Selections will be based on the level of the research, quality of the poster, and clarity of the presentation. The award will be presented during the last hour of each poster session. The winning presenters will receive a $50 cash award and certificate, thanks to the generous support of GMW. A ribbon will also be attached to the winning posters which will be prominently displayed for the remainder of the Conference.

A list of the Best Poster Award Winners from the 2017 MMM Conference and 2018 Intermag Conference is available at www.magnetism.org.

STUDENT TRAVEL SUPPORT

Conference Travel Grants supported by:

APS physics GMAG MAGNETISM

IEEE Travel Grants supported by:

IEEE MAGNETICS

Travel grants are offered to a limited number of students who are presenting their work at the Conference. Students who have not previously received a Conference or IEEE Magnetics Society travel grant are eligible for this program. Only one application per research group is accepted. Postdoctoral fellows and non-students are not eligible. Travel grant recipients for this Conference have already been informed about their selection. If you are interested in applying for a travel grant to attend a future MMM Conference, go to www.magnetism.org.

CHILD CARE SUPPORT

Child care grants are offered to a limited number of attendees who are bringing young children to the Conference or who incur extra expenses in leaving their children at home. The recipients for this Conference have already been informed about their selection. If you are interested in applying for child care support at a future MMM Conference, go to www.magnetism.org.

SOCIAL MEDIA

Be sociable—share! **#Joint**

Follow us on Twitter
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Like our Facebook page
www.facebook.com/JointConf/

FUTURE CONFERENCES

2019 Magnetism and Magnetic Materials Conference
November 4-8, 2019, Las Vegas, NV

2020 Intermag Conference
May 4-8, 2020, Montreal, Canada

2020 Magnetism and Magnetic Materials Conference
November 16-20, 2020, Fort Lauderdale, FL

2021 Intermag Conference
April 26-30, 2021, Lyon, France

2022 Joint MMM-Intermag Conference
January 10-14, 2022, New Orleans, LA

2022 Magnetism and Magnetic Materials Conference
October 31-November 4, 2022, Minneapolis, MN

2023 Magnetism and Magnetic Materials Conference
October 30-November 3, 2023 Dallas, TX

CONFERENCE ORGANIZATION

IEEE MAGNETICS SOCIETY ADVISORY COMMITTEE

President.. Pallavi Dhagat
(Term expiring December 31, 2020)
President Elect .... Masahiro Yamaguchi
Secretary/Treasurer .... Atsufumi Hirohata
Past President .... Manual Vazquez
(Term expiring December 31, 2018)

Committee Members *(Term expiring December 31, 2019)*:
Adekunle Adeyeye, Dora Altbir, Yukiko Kubota, Chih-Huang Lai, Stephane Mangin, Manfred Ruehrig, Rubem Sommer, Jan Sykulski

Committee Members *(Term expiring December 31, 2020)*:
Cindi Dennis, Peter Fischer, Simon Greaves, Mathias Kläui, June Lau, Hans Nembach, Teruo Ono, Thomas Thomson

Committee Members *(Term expiring December 31, 2021)*:
Elke Arenholz, David Jiles, Olga Kazakova, Nicoleta Lupu, Katsuji Nakagawa, Johannes Paulides, Günter Reiss, Shinji Yuasa

CONFERENCE MANAGEMENT COMMITTEE

General Chair .... Suzanne te Velthuis
Chair-Elect .... Shinji Yuasa
Past Chair .... Pallavi Dhagat
Co-Treasurers .... Kristen Buchanan and June Lau
Program Co-Chairs .... Laura H. Lewis and Steve May

Program Committee Members:

I. Fundamental Properties and Cooperative Phenomena
Sabine Wurmehl, Christianne Beekman, Yuko Hosokoshi, Natalia Perkins

II. Magnetoelectronic Materials and Phenomena
Kathrin Dörr, Marta Gibert, Margo Staruch

II. Magnetoelectronic Materials and Phenomena
Brian Kirby, Andrew May, Binghai Yan

III. Soft Magnetic Materials
Masahiro Yamaguchi, Yunume Obi, Rafael Pérez del Real

IV. Hard Magnetic Materials
Toshiyuki Shima, Ikenna Nlebedim, Jinbo Yang

IV. Hard Magnetic Materials
Jeffrey Shield, Felix Jimenez-Villacorta, Arjun Pathak

V. Structured Materials
Christian Binek, Jessada Chureemart, Karin Leistner, Melissa Loving

V. Structured Materials
Kathryn Krycka, Arantxa Fraile Rodríguez, Paola Tiberto

VI. Materials with Coupled Magnetic Functionality
Karl Sandeman, Victorino Franco, Manh-Huong Phan

VII. Spintronics: Fundamentals and Devices
Shiho Nakamura, Jingsheng Chen, Jean Anne Incorvia

VII. Spintronics: Fundamentals and Devices
Goran Mihajlovic, Chiara Ciccarelli, Satoru Emori, Ashwin Tulapurkar

VII. Spintronics: Fundamentals and Devices
Barry Zink, Byoung-Chul Min, Benjamin Jungfleisch, Stephen Wu

VII. Spintronics: Fundamentals and Devices
Peter Fischer, Karin Everschor-Sitte, Anjan Soumyanarayanan, Jiadong Zang

VIII. Magnetization Dynamics and Micromagnetics
Roopali Kukreja, Petru Andrei, Joe Barker, Thomas Schrefl

VIII. Magnetization Dynamics and Micromagnetics
Dafine Ravelosona, Claudia Mewes, Philipp Pirro, Justin Shaw

IX. Magnetic Recording
Yukiko Takahashi, Chris Rea, Tiffany Santos

X. Sensors (not Magnetic Recording), High Frequency and Power Devices
Denys Makarov, Ioanna Giouroudi, Chris Olson

X. Sensors (not Magnetic Recording), High Frequency and Power Devices
Paul Ohodnicki, Julia Zhang, Arcady Zhukov

X. Sensors (not Magnetic Recording), High Frequency and Power Devices
Hatem Elbidweihy, Babak Fahimi, Nuwantha Fernando, Aphrodite Ktena, Elena Lomonova

X. Sensors (not Magnetic Recording), High Frequency and Power Devices
Hongbin Yu, Kais Atallah, Jen-Yuan (James) Chang

XI. **Magnetic Characterization**
Dario Arena, Greg Fuchs, Christy Kinane

XII. **Interdisciplinary and Emerging Topics**
Hari Srikanth, Yanglong Hou, Galina Kurlyandskaya, Maria Torija

Publications Chair, AIPP.................. Victorino Franco

Editors (AIPP).................................. Fernando Bartolomé, Riccardo Hertel, Connie Li, Vivian Ng, Manh-Huong Phan, Kiyonori Suzuki

Publications Chair, IEEE .... Petru Andrei

Editors (IEEE)................................. Amr Adly, Yacine Amara, Radhika Barua, David Dorrell, Hatem Elbidweihy, Ravi Hadimani, Min-Fu Hsieh, Ron Jansen, Gangping Ju, Dennis Leung, Chunhua Liu, Thierry Lubin, Nicoleta Lupu, Frédéric Mazaleyrat, Iulian Nistor, Johannes Paulides, Philip Pong, Alexandru Stancu, Ciro Visone, Dan Wei, Hyunsoo Yang

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Abstracts/Publications Manager .... Regina Mohr
Exhibits Manager .... Jennifer Fiske
Registration Manager....................... Ashley Cesare

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Chair-Elect .... Suzanne te Velthuis
Executive Secretary/Treasurer .... June Lau
Recording Secretaries .... Diane Melton, Regina Mohr

Term expiring February 1, 2019:
Julie Borchers, Cindi Dennis, Peter Fischer, Chih-Huang Lai, June Lau, Kyung-Jin Lee, Laura H. Lewis, Alan MacDonald, Stephane Mangin, Christopher Marrows

Term expiring December 1, 2019:
Pallavi Dhagat, Victorino Franco, Chris Leighton, Philip Pong, Mark Stiles, Yayoi Takamura, Maria Varela, Manuel Vazquez, Randall Victora, Mingzhong Wu

Term expiring December 1, 2020:
Adekunle Adeyeye, Petru Andrei, Liesl Folks, Atsufumi Hirohata, Xiaofeng Jin, Mark Kief, Kai Liu, Yoshichika Otani, Tiffany Santos, Tom Thomson

SPONSORING SOCIETY REPRESENTATIVES

AIP Publishing .... Bill Burke
IEEE Magnetics Society .... Rudolf Schäfer

ADDITIONAL INFORMATION

To join our mailing list, please visit www.magnetism.org or contact info@mmmconference.com.

EXHIBITORS *(AS OF OCTOBER 22, 2018)*

An exhibition of magnetism-related services, equipment, materials, and software will be held in Exhibit Hall A.

Exhibit Hall Hours:

Tuesday/Thursday........ 8:15 am - 12:30 pm and 2:30 - 6:00 pm
Wednesday...................8:15 am - 12:30 pm and 1:30 – 4:30 pm

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AJA INTERNATIONAL, Inc.

Booth 5

Thin Film Deposition Systems (Sputtering, E-beam, Thermal, Ion Beam, PLD and Multi-Technique). Ion Beam Etch Systems with SIMS (Ion Milling, RIBE). R&D and Pilot Scale Equipment. UHV and HV Magnetron Sputter Sources and Thermal Evaporation Sources. Wide range of Substrate Holders featuring Azimuthal Rotation, RF/DC Biasing, Heating, Water Cooling, LN_2 Cooling and Tilting. Sputter Targets and Evaporation Materials. RF/DC Power Supplies.

Contact: Jim Hannon
Email: topgun@ajaint.com
Website: www.ajaint.com

APS physics

Booth 21

The American Physical Society (APS) is a non-profit membership organization that publishes the world's most widely read physics research and review journals: *Physical Review Letters*, *Physical Review X*, *Reviews of Modern Physics*, *Physical Review A-E*, *Physical Review Accelerators and Beams*, *Physical Review Applied*, *Physical Review Fluids*, *Physical Review Materials*, *Physical Review Physics Education Research*, and *Physics*. Please stop by our booth in the exhibit hall to learn more about our prestigious collection of journals.

Contact: Kenneth Newberry
Email: newberry@aps.org
Website: www.journals.aps.org

Booth 1

attocube is technology leader for nanoscale cryogenic measurement instrumentation, including low vibration closed-cycle cryostats, a cryo-optical table and various low temperature & high magnetic field compatible measurement inserts, allowing for research techniques such as AFM, MFM, SHPM, confocal & RAMAN microscopy. The attoTMS is attocube's powerful all-in-one solution for transport measurements based on the Nanonis Tramea™ electronics. Nano-precise piezo positioning stages and a laser displacement sensor with picometer resolution complete attocube's portfolio.

Contact: Joanna Kelkile
Email: info@attocube.com
Website: www.attocube.com

Booth 20

High current, high stability, highly accurate. Less than 1 ppm/K TC and less than 10 ppm ripple on wide current ranges are among some of our specs. CAEN ELS magnet power supplies are designed with a completely digital control and feedback loop, allowing for software-based adjustment of PID parameters, synchronizing fully and behaving nicely with your reactive loads (up to 100 H). Supporting large installations at many synchrotrons and colliders around the world, our offerings include standard and custom products. Home-grown DCCT current sensors are implemented within the supplies for aiding in such performance, or are available separately in various models with a complete digitizing current measurement system for your own setups. CAEN ELS is represented in the U.S. by CAEN Technologies.

Contact: Erik Soiman
Email: erik@caentechnologies.com
Website: www.caenels.com

Booth 2

GMW offers One- and Three-component Magnetic Sensors, Transducers and Field Mappers, including: Metrolab Three-Component Magnetic Field Probes with USB Interface and LabView software. Full-scale ranges of +/-100uT, +/-8mT, +/-3T and +/-20T. Senis One-, Two- and Three-Component Hall Transducers with analog output, full-scale field ranges to +/-20T and frequency response from dc to 75kHz. The Senis Probes can be used stand-alone or in Senis Magnetic Field Mapping Systems. We also offer GMW Electromagnets for magnetic material and thin film studies including the Miniature Projected Field Electromagnet family of: 5201 for in-plane fields; 5203 for vertical fields, 5205 series for larger volume, modest vertical fields, and 5204 for generating any field direction and amplitude from three components. HTS-110 compact Electromagnets including Short Solenoids to +/-3T and Projected Field magnets to +/- 2T.

Contact: Viki Beatty
Email: vbeatty@gmw.com
Website: www.gmw.com

Speed-Up Wafer-level Magnetic Test

Booth 18

Hprobe presents the fastest Magnetic ATE for MRAM and Magnetic Sensors (TMR...). Our products are designed to fasten your development time with turnkey Magnetic ATE, and increase your production throughput with world record field sweeping rate. Hprobe presents a full product family covering all the control and monitoring steps of MRAM manufacturing flow: Ferromagnetic thin film characterization, Ultra-Fast MOKE, Ferro-Magnetic Resonance...; Magnetic Parametric Testing of MRAM devices, for process control and monitoring; Magnetic Functional testing of MRAM array and System On Chip, for final testing and chip sorting.

Contact: Yann Richard
Email: yann.richard@hprobe.com
Website: www.hprobe.com

Booth 19

Based in Wellington, New Zealand, HTS-110 designs and manufactures a range of High Temperature Superconducting (HTS) products including compact cryogen-free HTS magnets, HTS motor coils and HTS current leads. HTS-110 magnets are used in many research areas including Magnetism, Quantum Hall Effect, Thin Films, X-Ray & Neutron Scattering, Spintronics and Superconducting Materials. Offerings include: Standard solenoid magnets up to 14 T with RT bore from Ø40 mm to Ø80 mm; Standard fast ramping split-pair magnets up to 8 T; Vector magnets; Vertical and horizontal projected field magnets; and Custom magnets.

Contact: Taotao Huang
Email: t.huang@hts-110.com
Website: www.scottautomation.com/hts-110/

Booth 16

Intlvac Thin Film provides customers with machinery needed for creating coatings including ion source and all parts needed to make it function. Additionally, we manufacture high quality PVD coatings using techniques such as Ion Assisted Thermal and Electron Beam Evaporation, Reactive and non-Reactive Magnetron Sputtering and Diamond Like Carbon by Plasma Enhanced Chemical Vapor Deposition. Research and development is key in giving our technology competitive advantage. We provide prototype and production run coating services to customers around the world. Intlvac Thin Film has become an authority in Ion Beam Etch/Sputter systems and reactive sputter systems for precision optical coating.

Contact: Ken Rennie
Email: jill@intlvac.com
Website: www.intlvac.com

Booth 22

IOP Publishing is a society-owned scientific publisher, providing impact, recognition and value for the scientific community. We work closely with researchers, academics, and partners worldwide to produce academic journals, ebooks, conference series, and digital products, covering the latest and best research in the physical sciences and beyond. This includes Journal of Physics D: Applied Physics, the pre-eminent European applied physics journal, publishing cutting-edge research and reviews under a broad scope including applied magnetism and applied magnetic materials.

Contact: Lisa Searle
Email: lisa.searle@iop.org
Website: www.ioppublishing.org

Booth 17

Kaufman & Robinson engineers and manufactures broad beam ion and plasma products. Our products are vacuum-based process tools which interact with materials at the atomic level. Typical material processes include the precision deposition of thin films, remote plasma etching of patterned wafers, and nanometer-scale modification of surfaces. We are respected across the globe for innovative designs, product quality and technical expertise. Our products incorporate technical features such as gridded or gridless sources, DC or RF discharges and automated power supply controllers.

Contact: Carrie Stadtmueller
Email: stadtmueller@ionsources.com
Website: www.ionsources.com

Booth 6

A fully integrated manufacturer of thin film deposition systems, vacuum components and materials. Our new High-Power IMPULSE Magnetron (HiPIM's) power supply and TORUS® Mag Keeper magnetron combination delivers films with better adhesion, improved grain structure and fewer defects than conventional sputtering. This advanced cathode is also available in an Ultra-High Vacuum version. Lesker's thin film deposition systems include the improved Pro-Line PVD 75, enhanced for flexibility of layout, deposition, operation and expansion. Our eKLipse™ control software makes recipe development and execution easy. Materials for research include: Co, Fe, Ir, Ni, Pt; and alloys and oxides such as Permalloy, $BiFeO_3$, YIG, FeCoMn, MoS_2, Fe_3O_4, and LaSrMnO.

Contact: Bill Zinn
Email: salesUS@lesker.com
Website: www.lesker.com

Booth 3

Lake Shore offers electromagnet-based VSMs for characterizing magnetic properties over a range of temperatures (4.2 K to 1273 K) and fields to 3.42 T. Among these is the award-winning 8600 Series VSM, which combines high sensitivity (33 nemu), measurement speed (10 ms/pt), and simple operation in a system capable of accurately characterizing a broad range of materials with unprecedented ease. Also available: magnetic test and measurement instruments, including gaussmeters and a new line of dependable, precise, easy-to-use teslameters, as well as cryogenic probe stations with integrated field magnets for on-wafer magneto-transport, DC, RF, or microwave measurements.

Contact: Andy Phllips
Email: sales@lakeshore.com
Website: www.lakeshore.com

Booth 23

MANTIS-SIGMA, the partnership of MANTIS Deposition and SIGMA Surface Science, is dedicated to the development and manufacture of high-quality systems and components for cutting-edge applications in nanotechnology, thin film deposition, and surface analysis. We enable researchers to both create and analyse thin films for advanced materials and device development. MANTIS specializes in MBE, PLD, UHV nanoparticle e-beam, and sputtering deposition. We offer a range of nanotechnology, RF atom and ion sources, sputter cathodes, mini e-beam evaporators, organic evaporators and modular R&D deposition systems. SIGMA specializes in state-of-the-art surface analysis technology with an exciting new range of UHV tools for ESCA and SPM.

Contact: Anthony Graziano
Email: anthony.graziano@mantis-sigma.com
Website: www.mantis-sigma.com

Booth 10

MicroSense is a leading manufacturer of magnetic measurement systems for research and production. MicroSense VSMs are sensitive, easy to use fast and versatile. The MicroSense VSMs offer the highest field, the highest maximum temperature and the widest range of options of any resistive magnet VSM. Options offered including low and high temperature, Magneto-resistance (AC and DC, in-plane and perpendicular), Vector/Torque, FMR, MOKE and automatic sample loading. MicroSense also offers a range of non-contact, full wafer or disk research and production metrology systems for in-plane and perpendicular MRAM, hard disk, recording head and sensor manufacturing process control.

Contact: Erik Samwel
Email: esamwel@microsense.net
Website: www.microsense.net

nanoscan

Booth 4

NanoScan is a member of the IONTOF group of companies. We are specialized in high-vacuum Scanning Probe Microscopes and our flagship microscope, the VLS-80, offers a high-end standalone solution for high-vacuum SPM. It runs all SPM modes of imaging and is equipped with two phase-locked loops to enable dual frequency modes. Magnetic imaging is a key strength of the VLS-80, with 550 mT out-of-plane, 200 mT in-plane magnetic field options and 10-nm lateral resolution guaranteed; an industry best. The large stage offers excellent positioning repeatability over the complete range of 100mm x 100mm.

Contact: Marco Corbetta
Email: m.corbetta@nanoscan.ch
Website: www.nanoscan.ch

OHT

Booth 8

OHT as an expert of Non-Contact Inspection System, offer the highest level of MRAM inspection System in the industry.

Contact: Se Kageyama
Email: se_kageyama@ohtinc.jp
Website: www.oht-inc.co.jp

PVD PRODUCTS

Booth 11

PVD Products, Inc: Enabling Coating Method and Design. PVD Products is the leading manufacturer of custom thin film deposition systems, reel-to-reel deposition equipment for the coated-conductor market, and combinatorial deposition tools for rapid process development. A wide variety of our custom deposition systems are now operating in many high-profile universities and national labs around the world, as well as start-up and Fortune 500 companies.

Contact: Larry Scipioni
Email: lscipioni@pvdproducts.com
Website: www.pvdproducts.com

Booths 14 & 15

Quantum Design manufactures automated material characterization systems providing temperatures from 0.05 to 1000 K, magnetic fields up to 16 tesla, and a wide range of measurements., including: VSM magnetometry, magneto resistance, sample rotator, thermal expansion, Raman spectroscopy, FMR and SPM. Platforms include the PPMS®, MPMS®3, VersaLab, and DynaCool. Quantum Design also recently introduced an innovative 7 tesla magneto-optical cryostat (OptiCool™). All systems have cryogen free options. Quantum Design also manufactures advanced heliiuheliumfiers (ATL80, ATL 160) and recovery systems. They distribute direct write, e-beam and nano-lithography systems, NanoMOKE, single crystal furnaces, AFM for SEM/FIB, SNSPD based single photon detectors and time tagging electronics.

Contact: Dan Polancic
Email: info@qdusa.com
Website: www.qdusa.com

Booth 7

SINGULUS TECHNOLOGIES is a renowned manufacturer of advanced thin-film deposition equipment for MRAM, thin-film head, sensor and other semiconductor applications. Already established in the field, SINGULUS TECHNOLOGIES recently introduced the second generation of its TIMARIS PVD Cluster Tool platform, comprising a complete portfolio of process modules for different applications. These include the deposition of ultra-thin Metallic and insulating films down to thickness of one nanometer and below, as well as stacks of such films with very precise material thickness and high uniformity specifications.

Contact: Bernhard Krause
Email: sales@singulus.de
Website: www.singulus.de

Booth 24

SmartTip has extended its range of magnetic analysis tools with the SmartProber P1, a 300 mm capable 6 kOe perpendicular field CIPT tool. Find out more about this and our other affordable CIPT analysis tools at our booth. As the world's only AFM probe provider specializing in MFM probes, we also continue to offer a range of MFM probe solutions fit to your specific application: hard magnetic media, soft magnetic structures, applied field measurements, etc. Our Smart Coating technology guarantees very high resolution and reproducible results.

Contact: Daniel Bijl
Email: d.bijl@smarttip.nl
Website: www.smarttip.nl

Ube Material Industries,Ltd.

Booth 12

We are going to exhibit our MgO sputtering target which is indispensable for spintronics applications. We can provide the world's largest class MgO sputtering target (18 inch/460 mm) which is high purity (the actual measurement value is 99.999%) and high density (the actual measurement value is 99.7%). And, our MgO sputtering target has high mechanical strength. It will reduce the risk of target cracking. Furthermore, we are manufacturing the raw material "high purity MgO powder" by ourselves. So, we will be able to provide you sufficient quantity of high quality MgO sputtering target.

Contact: Mishima Takuya
Email: takuya.mishima@ubematerials.co.jp
Website: www.ubematerial.com

VINCI TECHNOLOGIES

Booth 9

Vinci Technologies is an independent French company, specialized in the design, manufacturing and marketing of instrumentation, for the high vacuum and Oil & Gas industries. Based in Paris, the company has 80+ employees including one subsidiary in the US and one in India. The vacuum division of the company designs complete thin film analysis & deposition systems (thermal and e-beam evaporation, sputtering, pulse laser deposition, Molecular Beam Epitaxy, UHV Transfer Tunnels, ...). By combining satellite growth systems along the UHV linear transfer Tunnel, Vinci provide complete Lab solutions that addresses all technical requests of nanotechnology centers across the globe.

Contact: Christine Walsh
Email: c.walsh@vinci-technologies.com
Website: www.vinci-technologies.com

Zurich Instruments

Booth 13

Zurich Instruments is a test and measurement company based in Zurich, Switzerland, developing and selling measurement instruments and delivering customer support in key markets around the world, either directly or with carefully selected partners. Our core offering includes lock-in amplifiers, phase-locked loops, arbitrary waveform generator, impedance analyzers, digitizers and boxcar averagers. We believe that system integration is good. We believe that system integration leads to significant time savings, reduced lab setup complexity, efficient workflows and reliable, accurate measurements.

Contact: Jelena Trbovic
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Website: www.zhinst.com

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AIP Publishing

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Invited and contributed papers presented at the Joint Conference will be published, in part, in AIP Publishing's journal *AIP Advances* (aipadvances.aip.org). *AIP Advances* is a peer-reviewed, open access journal, that has an inclusive scope covering all areas of physical science. The journal is freely accessible to the global public and therefore offers a high level of visibility to magnetism and magnetic materials research presented at the Joint MMM-Intermag Conference. Conference presenters who submit their paper to *AIP Advances* will be able to publish without paying the open access fee.

IEEE MAGNETICS

The IEEE Magnetics Society is the leading international professional organization for magnetism and related professionals throughout the world. The IEEE Magnetics Society promotes the advancement of science, technology, applications and training in magnetism. It fosters presentation and exchange of information among its members and within the global technical community, including education and training of young engineers and scientists. It seeks to nurture positive interactions between all national and regional societies acting in the field of magnetism.

CONFERENCE SUPPORTERS

TUESDAY BIERSTUBE SUPPORT

MATERION

Materion offers the widest range of high purity thin film materials to meet your advanced memory requirements. We have a comprehensive portfolio of specialty materials to support STT-RAM (MRAM) applications. These include fine-microstructure precious metals such as Palladium alloys, Platinum alloys, Iridium alloys and Ruthenium. We manufacture high purity tunnel junction materials of Magnesium, Magnesium Oxide and Magnesium-Aluminum alloys. Our casting and purification technology produces CoFe and CoFeB alloys with very low oxygen impurity. In addition, we offer services such as sputter target bonding, precision parts cleaning, and precious/high value metal reclamation services.

TUESDAY COFFEE BREAK SUPPORT

Oxford University Press is a department of the University of Oxford. It furthers the University's objective of excellence in research, scholarship, and education by publishing worldwide.

MEET THE EXPERTS SUPPORT

The evico magnetics GmBH was founded in 2006 as a spin-off of the Leibniz Institut for Solid State and Materials Research (IFW) Dresden. The main products are: (i) Advanced magneto-optical wide-field Kerr microscope systems for the visualization of magnetic domains and magnetization processes in all kinds of magnetic materials. The Kerr microscopes also serve as magneto-optical magnetometers for the sensitive and local measurement of hysteresis loops by MOKE magnetometry. (ii) High Pressure Milling Vials with a gas temperature monitoring system for the synthesis of magnetic powders and hydrogen storage materials.

LANYARD SUPPORT

WIFI SUPPORT

The American Physical Society (APS) is a non-profit membership organization that publishes the world's most widely read physics research and review journals: *Physical Review Letters*, *Physical Review X*, *Reviews of Modern Physics*, *Physical Review A-E*, *Physical Review Accelerators and Beams*, *Physical Review Applied*, *Physical Review Fluids*, *Physical Review Materials*, *Physical Review Physics Education Research*, and *Physics*. Please stop by our booth in the exhibit hall to learn more about our prestigious collection of journals.

CONFERENCE PROGRAM-AT-A-GLANCE

MONDAY, JANUARY 14, 2019

2:30 pm to 5:00 pm

TU	Tutorial: Foundational Methods for Understanding Magnetic Materials	*Salon 2*

TUESDAY, JANUARY 15, 2019

8:30 am to 11:30 am • Oral Sessions

AA	Symposium: Spin-transport in Insulators: From Transport in Ferromagnets to Unconventional Magnonics in Antiferromagnets	*Salon 2*
AB	Spin and Valley Hall Effect in 2D and Topological Systems	*Salon 3*
AC	Chiral Spintronics, DMI and Domain Walls	*Salon 1*
AD	Exchange Bias	*Maryland*
AE	Magneto-caloric Materials I	*Virginia*
AF	Soft Magnetic Materials I: Ferrites, Garnets and Others	*Delaware*
AG	Magnetoresistive Effects for Sensor Applications	*Washington 1*
AH	Correlated Nanoparticles and Nanowires	*Washington 2*
AI	Energy Assisted Magnetic Recording I	*Washington 5*

9:30 am to 12:30 pm • Poster Sessions — *Exhibit Hall A*

AJ	Spin Hall Effect, Spin Injection and Related Effects
AK	Spin Transfer Torque MRAM I
AL	Soft Magnetic Components: Electrical Machinery Applications
AM	Neuromorphic, Logic, and Spin Injection Devices
AN	Multiferroics and Complex Oxides I
AO	Motors: Modeling and Simulations I
AP	Rock Magnetism, Magnetic Fluids and Imaging
AQ	High Frequency and Magnetoelastic Effects for Sensor Design I
AR	Multi-layered Films and Superlattices I
AS	Rare-earth Intermetallics and Compounds I

1:30 pm to 4:30 pm • Oral Sessions

BA	Symposium: Magnetic Nanoparticles and Nanograins for Biosensing and Magnetic Recording	*Salon 2*
BB	Spin Currents & Spin-orbit Torques: From Intrinsic to Interfacial	*Salon 3*
BC	Skyrmions I	*Salon 1*
BD	Domain Wall and Related Devices	*Maryland*
BE	Magnetic Semiconductors and Magnetism in Heusler Compounds	*Virginia*
BF	Critical Phenomena, Quantum Spin Liquids, f-electron Magnetism and Molecular Magnets	*Delaware*
BG	Motors: Design and Analysis I	*Washington 1*
BH	Patterned Films	*Washington 2*
BI	Rare-earth Intermetallics and Compounds II	*Washington 5*

2:30 pm to 5:30 pm • Poster Sessions *Exhibit Hall A*

BJ	Magnetic Fields and Cellular Response	
BK	Motors in Automotive Applications	
BL	Motors in Wind and Wave Applications	
BM	Soft Magnetic Components: Wireless Power	
BN	Multiferroics and Complex Oxides II	
BO	Topological Spin Textures I	
BP	Magneto-caloric, Magneto-elastic and Magneto-optical Materials	
BQ	Soft Magnetic Materials II: Ferrites and Garnets	
BR	Hard Magnetic Materials: Ferrites and Composites	
BS	Voltage-Controlled Magnetic Anisotropy and Switching I	

WEDNESDAY, JANUARY 16, 2019

8:30 am to 11:30 am • Oral Sessions

CA	Symposium: Switching Antiferromagnets by Spin-orbit Torques	*Salon 2*
CB	Spin-Charge Conversion and Materials	*Salon 3*
CC	Novel Applications of MRAM: Neuromorphic Computing and Cryogenic Memory	*Salon 1*
CD	Multiferroics and Magnetoelectric Phenomena I	*Maryland*
CE	Magneto-caloric and Magneto-elastic Materials	*Virginia*
CF	Magnetization Dynamics I	*Delaware*
CG	Soft Magnetic Materials III: Amorphous and Nanocrystalline Materials	*Washington 1*
CH	Motors: Design and Analysis II	*Washington 2*
CI	Rare-earth Intermetallics and Compounds III	*Washington 5*

9:30 am to 12:30 pm • Poster Sessions *Exhibit Hall A*

CJ	Motors: Modeling and Simulations II	
CK	Motors: Modeling and Simulations III	
CL	Soft Magnetic Components: Energy Harvesting and Acoustics	
CM	High Frequency and Magnetoelastic Effects for Sensor Design II	
CN	Critical Phenomena, f-electron Magnetism and Organic Magnets	
CO	Biomaterials and Transcranial Stimulation	
CP	2D Materals and Magnetic Semiconductors	
CQ	Bit Patterned Media & Perpendicular Magnetic Recording	
CR	Spinwaves	
CS	Magnetic Sensors and Devices	

1:30 pm to 3:18 pm • Oral Sessions

DA	Voltage-Controlled Magnetic Anisotropy and Switching II	*Salon 2*
DB	Ultrafast Dynamics	*Salon 3*
DC	Thermal Spin Physics and Magnetothermoelectric Effects	*Salon 1*
DD	New Coupled Magnetic Phenomena	*Maryland*
DE	Complex Oxides	*Virginia*
DF	Highly Frustrated Magnetism and Spin Glasses I	*Delaware*
DG	Individual Nanoparticles and Nanowires	*Washington 1*
DH	Energy-Assisted Magnetic Recording and Bit Patterned Media	*Washington 2*
DI	Metrology and Spintronic Devices	*Washington 5*

1:30 pm to 4:30 pm • Poster Sessions — *Exhibit Hall A*

DJ	Spin Currents and Spin-orbit Torques
DK	Magneto-caloric Materials II
DL	Soft Magnetic Components: Transformers and Inductors I
DM	Hard Magnetic Materials Theory and Application I
DN	Magnetic Particles and Hyperthermia
DO	Motors: Modeling and Simulations IV
DP	Motors: Modeling and Simulations V
DQ	Magnetic Instrumentation and Characterization I
DR	Soft Magnetic Materials IV: Crystalline, Nanocrystalline and Amorphous Materials

4:30 pm to 6:30 pm

YA	Plenary	*Salons 2 & 3*

THURSDAY, JANAURY 17, 2019

8:30 am to 11:30 am • Oral Sessions

EA	Symposium: 3D Magnetic Frustration: Pyrochlore, Spinel and FCC Lattices	*Salon 2*
EB	Symposium: Magnetism for the Brain: Challenges and Solutions	*Salon 3*
EC	Skyrmions II	*Salon 1*
ED	Spinwaves and Magnonics	*Maryland*
EE	Multiferroics and Magnetoelectric Phenomena II	*Virginia*
EF	Magnetization Dynamics II	*Delaware*
EG	Magnetic Imaging and Measurement Techniques I	*Washington 1*
EH	Thin Films and Surface Effects I	*Washington 2*
EI	New and Nanostructured Permanent Magnets I	*Washington 5*

9:30 am to 12:30 pm • Poster Sessions		*Exhibit Hall A*
EJ	Nanoparticles and Nanowires	
EK	Energy Assisted Magnetic Recording II	
EL	Magnetism in Heusler Alloys	
EM	Magneto-caloric Materials III	
EN	Soft Magnetic Components: Transformers and Inductors II	
EO	Actuation	
EP	Soft Magnetic Materials V: Amorphous and Nanocrystalline Materials	
EQ	Motors: Control and Drives	
ER	Actuation, Shielding and Levitation	
12:00 pm to 1:00 pm		
	Smithsonian National Zoo Lecture	*Maryland*
1:30 pm to 4:30 pm • Oral Sessions		
FA	Symposium: Voltage Control of Nanomagnetism	*Salon 2*
FB	Spin-orbit Torque Switching	*Salon 3*
FC	Topological Spin Textures II	*Salon 1*
FD	Magnetic Field Sensors and Applications at High Frequencies	*Maryland*
FE	Magneto-caloric and Magneto-optical Materials	*Virginia*
FF	Spin Transfer Torque MRAM II	*Delaware*
FG	Micromagnetic and Hysteresis Modeling I	*Washington 1*
FH	Soft Magnetic Components: Performance, Modeling and Optimization	*Washington 2*
FI	Magnetic Nanoparticles for Biomedical Applications and Imaging	*Washington 5*
2:30 pm to 5:30 pm • Poster Sessions		*Exhibit Hall A*
FJ	New and Nanostructured Permanent Magnets II	
FK	Thin Films and Surface Effects II	
FL	Magnetization Dynamics III	
FM	Spin Caloritronics and Spin Mechatronics	
FN	Magnetic Instrumentation and Characterization II	
FO	Tunneling Magnetoresistance, Giant Magnetoresistance, Hall Effect and Related Effects	
FP	Highly Frustrated Magnetism and Spin Glasses II	
FQ	Motors: Modeling and Simulations VI	
FR	Motors: Modeling and Simulations VII	
6:00 pm to 7:30 pm		
XA	Evening Session: Forefront Issues and New Opportunities in Magnetic Materials	*Salon 2*

FRIDAY, JANUARY 18, 2019

8:30 am to 11:30 am • Oral Sessions

GA	Symposium: Energy Harvesting and Transformations based on Magnetic Materials	*Salon 2*
GB	Antiferromagnetic Spintronics	*Salon 3*
GC	Tunneling Magnetoresistance and Tunneling Anisotropic Magnetoresistance	*Salon 1*
GD	Spin-orbit Torque and Spin Injection Devices	*Maryland*
GE	Motors Applications, Actuators, Shielding and Levitation	*Virginia*
GF	Magnetic Fluids, Composites and Biomedical Devices	*Delaware*
GG	Magnetic Imaging and Measurement Techniques II	*Washington 1*
GH	Multi-layered Films and Superlattices II	*Washington 2*
GI	Hard Magnetic Materials Theory and Application II	*Washington 5*

9:30 am to 12:30 pm • Poster Sessions — *Exhibit Hall A*

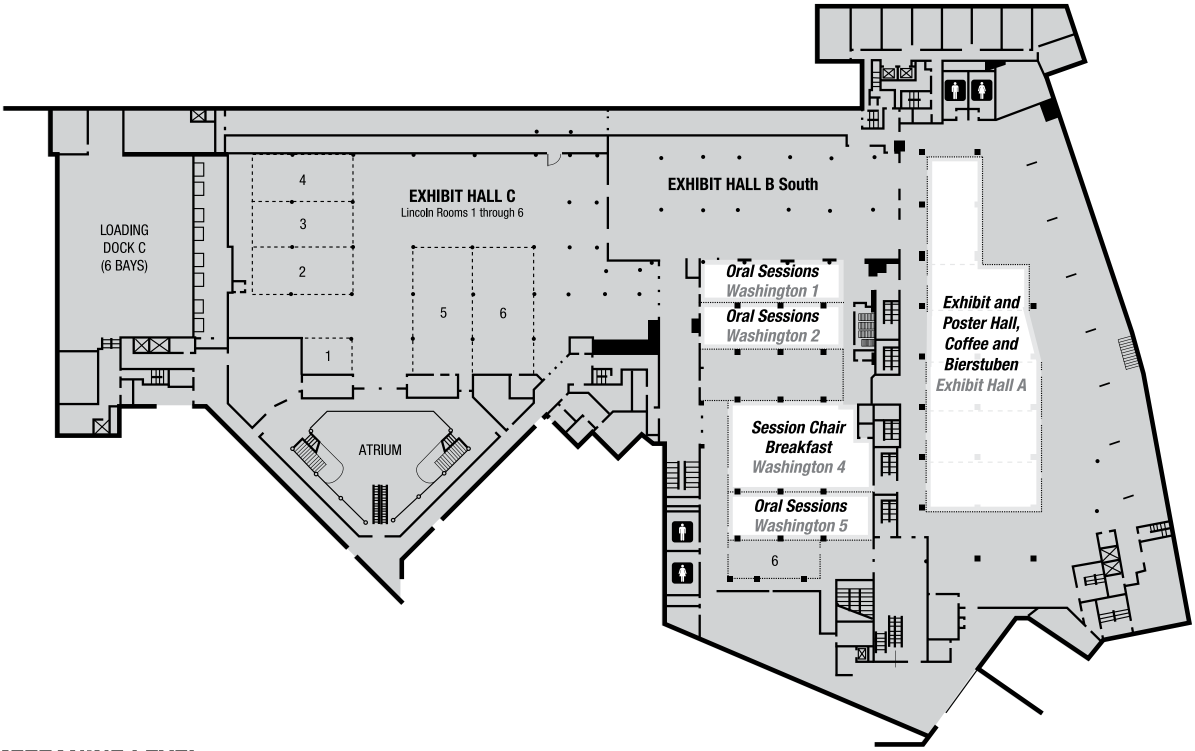
GJ	Magnetic Field Sensors and Applications
GK	Exchange Bias and Nanomagnetism
GL	Soft Magnetic Components: Other Applications
GM	Magneto-elastic Materials
GN	Domain Wall Dynamics and Devices
GO	Motors: Modeling and Simulations IX
GP	Motors: Modeling and Simulations VIII
GQ	Skyrmions III
GR	Multiferroics and Complex Oxides III
GS	Micromagnetic and Hysteresis Modeling II

1:30 pm - 4:30 pm • Oral Sessions

HA	Symposium: Magnetism Research Using X-ray Free Electron Lasers	*Salon 2*
HB	Spin Transport & Relaxation in Nanoscale Materials and Devices	*Salon 3*
HC	Skyrmions IV	*Salon 1*
HD	Spin Torque Oscillators and Spin Waves	*Maryland*
HE	Spinwaves and Spin Dynamics	*Virginia*
HF	Novel Sensor Architectures and Applications	*Delaware*
HG	Topological Insulators and Magnetism in 2D Materials	*Washington 1*
HH	Magnetoresistance, Hall Effect and Related Effects	*Washington 2*
HI	Motor Applications	*Washington 5*

WASHINGTON MARRIOTT WARDMAN PARK

EXHIBITION LEVEL



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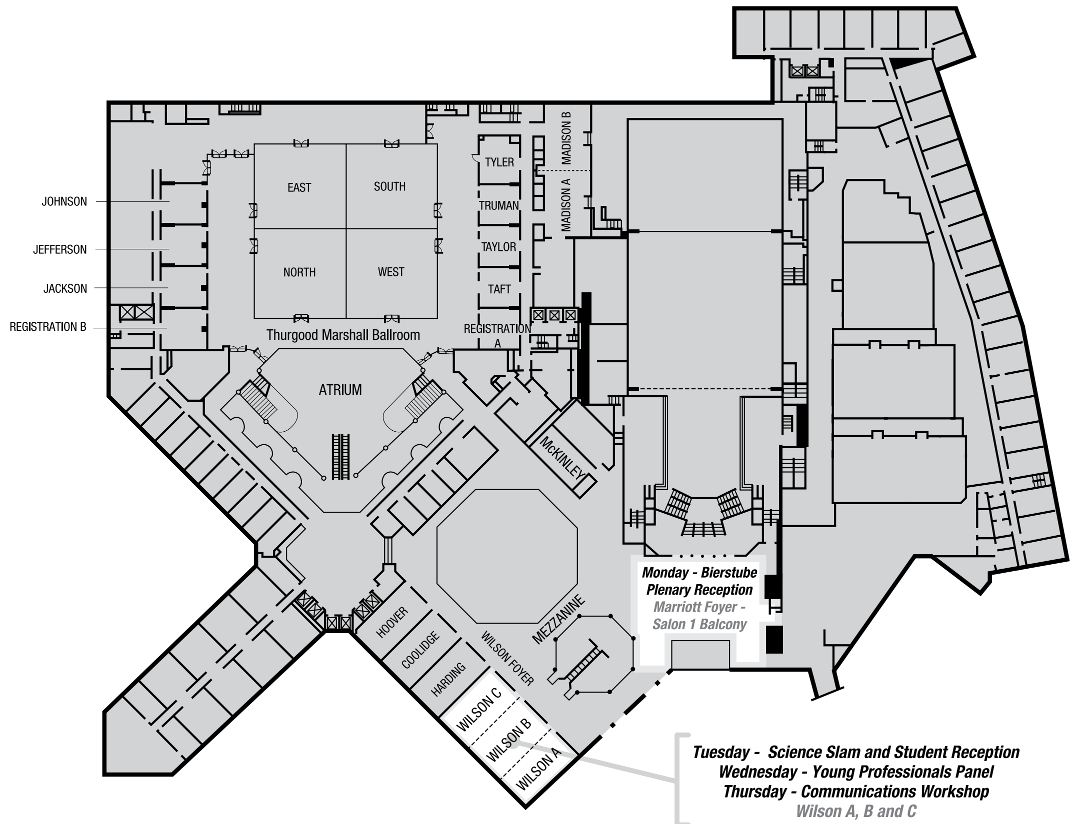

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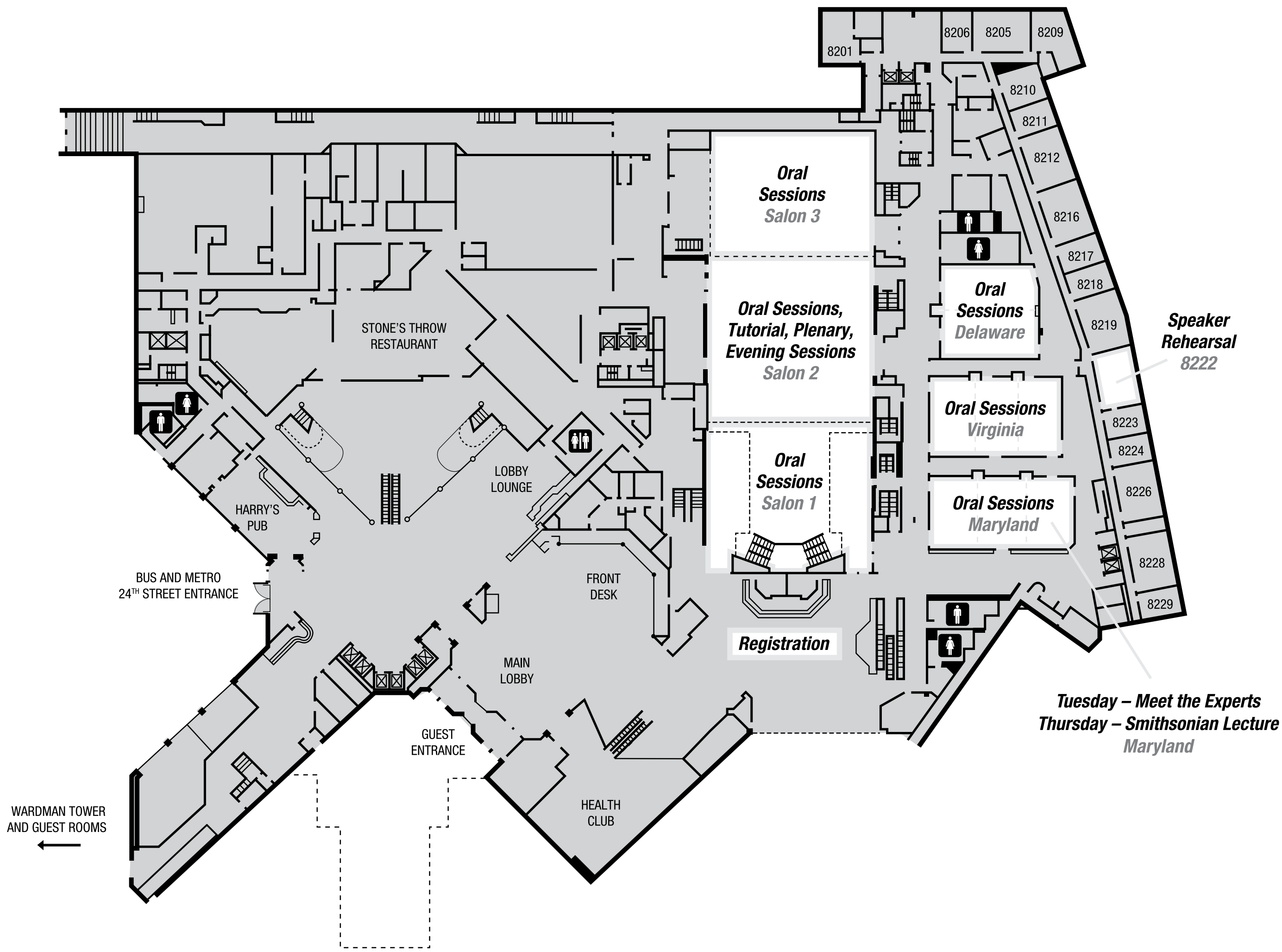
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Oral Sessions Salon 1
Oral Sessions Delaware
Oral Sessions Virginia
Oral Sessions Maryland
Registration
Tuesday – Meet the Experts
Thursday – Smithsonian Lecture
Maryland
STONE'S THROW RESTAURANT
LOBBY LOUNGE
HARRY'S PUB
BUS AND METRO 24TH STREET ENTRANCE
FRONT DESK
MAIN LOBBY
GUEST ENTRANCE
HEALTH CLUB
WARDMAN TOWER AND GUEST ROOMS

MONDAY AFTERNOON 2:30 | SALON 2

Session TU
TUTORIAL: FOUNDATIONAL METHODS FOR UNDERSTANDING MAGNETIC MATERIALS

Steve May, Co-Chair
Drexel University, Philadelphia, PA, United States
Laura H. Lewis, Co-Chair
Northeastern University, Boston, MA, United States

2:30

TU-01. **Magnetometry – the Good, the Bad and the Ugly.** ***(Invited)*** *P.S. Stamenov[1] 1. Trinity College Dublin, Dublin, Ireland*

3:20

TU-02. **Computational Methods in Magnetism: From First Principles to Magnetization Dynamics.** ***(Invited)*** *C.K. Mewes[1] 1. MINT Center/Department of Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States*

4:10

TU-03. **Ferromagnetic Resonance.** ***(Invited)*** *M. Wu[1] 1. Colorado State University, Fort Collins, CO, United States*

TUESDAY MORNING 8:30 | SALON 2

Session AA
SPIN-TRANSPORT IN INSULATORS: FROM TRANSPORT IN FERROMAGNETS TO UNCONVENTIONAL MAGNONICS IN ANTIFERROMAGNETS

Andrii Chumak, Chair
Technische Universität Kaiserslautern, Kaiserslautern, Germany

8:30

AA-01. **Control of optimized magnon spin transport in ferromagnetic insulators.** ***(Invited)*** *B. Van Wees[1] 1. Zernike Institute for Advanced Materials, Groningen, Netherlands*

9:06

AA-02. **Spin Current in Uniaxial Antiferromagnets and Quantum Spin Liquids.** ***(Invited)*** *E. Saitoh[1,2] 1. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 2. ERATO-SQR, JST, Tokyo, Japan*

9:42

AA-03. **Room Temperature Electrically Tunable Long-Distance Spin Transport in Antiferromagnetic Insulators.** ***(Invited)*** *R. Lebrun*[1], A. Ross[1], S. Bender[2], A. Qaiumzadeh[3], L. Baldrati[1], J. Cramer[1], A. Brataas[3], R. Duine[2] and M. Kläui[1] *1. Johannes Gutenberg University, Mainz, Germany; 2. Utrecht University, Utrecht, Netherlands; 3. Norwegian University of Science and Technology, Trondheim, Norway*

10:18

AA-04. **Long-Distance Spin Transport Through a Graphene Quantum Hall Antiferromagnet.** ***(Invited)*** *C. Lau*[1] *1. The Ohio State University, Columbus, OH, United States*

10:54

AA-05. **Nonequilibrium Spin Transport in Quantum Paramagnets.** ***(Invited)*** J. Aftergood[1,2], D. Joshi[3], A. Schnyder[3], A. Mitra[4] and *S. Takei*[1,2] *1. Physics, Queens College of The City University of New York, Queens, NY, United States; 2. The Graduate Center of The City University of New York, New York, NY, United States; 3. Max Planck Institute for Solid State Research, Stuttgart, Germany; 4. Physics, New York University, New York, NY, United States*

TUESDAY MORNING 8:30 — SALON 3

Session AB

SPIN AND VALLEY HALL EFFECT IN 2D AND TOPOLOGICAL SYSTEMS

Byong-Guk Park, Chair
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea

8:30

AB-01. **Electrical Detection of Charge-to-Spin and Spin-to-Charge Conversion in a Topological Insulator Bi_2Te_3 Using BN/Al_2O_3 Hybrid Tunnel Barrier.** *C.H. Li*[1], O. Van't Erve[1], C. Yan[2], L. Li[2] and B. Jonker[1] *1. Naval Research Lab, Washington, DC, United States; 2. Department of Physics and Astronomy, West Virginia University, Morgantown, WV, United States*

8:42

AB-02. **Spin-orbit toque driven magnetization switching in WTe_2/ferromagnet heterostructures.** *S. Shi*[1,2], S. Liang[1], K. Cai[1], S. Pollard[1], Y. Wang[1], Q. Wang[1], J. Wang[3,2], G. Eda[3,2] and H. Yang[1,2] *1. Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 2. Centre for Advanced 2D Materials, National University of Singapore, Singapore, Singapore; 3. Physics, National University of Singapore, Singapore, Singapore*

8:54

AB-03. **Observation of high spin-to-charge conversion by sputtered $Bi_xSe_{(1-x)}$ at room temperature.** *D.C. Mahendra*[1], J. Chen[2], T. Peterson[1], P. Sahu[1] and J. Wang[2,1] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

9:06

AB-04. **Spin and Valley Hall Effect in n- and p- Type WSe_2 Transistors Controlled via Electric Field.** ***(Invited)*** E. Barre[2], X. Li[1], S. Kim[3], E. Antunano[1], H. Wong[2], T. Heinz[3] and *J.C. Incorvia*[1] *1. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States; 2. Electrical Engineering, Stanford University, Stanford, CA, United States; 3. Applied Physics, Stanford University, Stanford, CA, United States*

9:42

AB-05. **Valley Coupled Spin Hall Effect in WSe_2.** *T. Hung*[1] and Z. Chen[1] *1. ECE, Purdue University, West Lafayette, IN, United States*

9:54

AB-06. **Imaging of current induced spin accumulation in topological insulators and heavy metals.** *Y. Liu*[1], J. Besbas[1], Y. Wang[1], P. He[1], M. Chen[1], D. Zhu[1], Y. Wu[1], J. Lee[1], L. Wang[2], J. Moon[3], N. Koirala[3], S. Oh[3] and H. Yang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 2. School of Science, Physics, RMIT University, Melbourne, VIC, Australia; 3. Department of Physics and Astronomy, Rutgers, The State University of New Jersey, Piscataway, NJ, United States*

10:06

AB-07. **Spin-Orbit Torque and Nernst Effects in Bi_xSb_{1-x}/Ferromagnet Heterostructures.** *N. Roschewsky*[1*], E.S. Walker[2], P. Gowtham[3], F. Hellman[1], S.R. Bank[2] and S. Salahuddin[3] *1. Physics, UC Berkeley, Berkeley, CA, United States; 2. ECE, UT Austin, Austin, TX, United States; 3. EECS, UC Berkeley, Berkeley, CA, United States*

10:18

AB-08. **Room Temperature Spin-Orbit Torque Measurements of Sputtered Bismuth Antimonide.** *T. Gosavi*[1], K. Oguz[1], C. Lin[1], S. Manipatruni[1], D.E. Nikonov[1] and I. Young[1] *1. Components Research, Intel Corp, Hillsboro, OR, United States*

10:30

AB-09. **Voltage-Controlled Topological Spin-Switch for Approximate Computing.** *S. Rakheja*[1], M.E. Flatte[2] and A.D. Kent[3] *1. Electrical and Computer Engineering, New York University, Brooklyn, NY, United States; 2. Physics and Astronomy and Optical Science and Technology Center, University of Iowa, Iowa City, IA, United States; 3. Physics, New York University, New York, NY, United States*

10:42

AB-10. **Toward Two Dimensional Dirac Half Metallic MnX_3 for Spintronics.** *Q. Sun*[1] and N. Kioussis[1] *1. Physics and Astronomy Department, California State University, Northridge, CA, United States*

10:54

AB-11. **The spin texture in a $SrTiO_3$(111) two-dimensional electron gas.** *P. He*[3], S. McKeown Walker[1], S. Zhang[2], F. Bruno[1], M. Bahramy[4], O. Heinonen[2], G. Vignale[5], F. Baumberger[1] and H. Yang[3] *1. Department of Quantum Matter Physics, University of Geneva, Geneva, Switzerland; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 4. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 5. Department of Physics and Astronomy, University of Missouri, Columbia, MO, United States*

11:06

AB-12. **Spin orbit gaps and magnetotransport in epitaxial monolayers of Fe on Au(001).** *L. Plucinski*[1], E. Mlynczak[1], P. Gospodaric[1] and C.M. Schneider[1] *1. PGI-6, FZ Juelich, Juelich, Germany*

TUESDAY MORNING 8:30 — SALON 1

Session AC
CHIRAL SPINTRONICS, DMI AND DOMAIN WALLS
Tim Mewes, Chair
University of Alabama, Tuscaloosa, AL, United States

8:30

AC-01. **Controlling Asymmetric Expansion of Magnetic Bubbles by Chiral Damping and Dzyaloshinksii-Moria Interaction.** *A. Ganguly*[1], I. Miron[2,3] and A. Manchon[1] *1. Physical Science and Engineering, King Abdullah University of Science and Technology, Thuwal 23955-6900, Saudi Arabia; 2. CEA, INAC, SPINTEC, 38000 Grenoble, France; 3. CNRS, SPINTEC, 38000 Grenoble, France*

8:42

AC-02. **Assessing a refined elastic model of Dzyaloshinskii domain wall creep using composition graded Pt-Ir-Au seedlayers in Co/Ni heterostructures.** D.K. Lau[1], J.P. Pellegren[1], H. Nembach[2], J.M. Shaw[2] and *V. Sokalski*[1] *1. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Quantum Electromagnetics Division, NIST, Boulder, CO, United States*

8:54

AC-03. **Determination of the Dzyaloshinskii-Moriya interaction in epitaxial asymmetric trilayers.** F. Ajejas[1], A. Gudin[1], R. Guerrero[1], J. Vogel[2], J. Camarero[1], S. Pizzini[2] and *P. Perna*[1] *1. IMDEA Nanociencia, Madrid, Spain; 2. Institut Néel, Grenoble, France*

9:06

AC-04. **Twisted domain walls and skyrmions in perpendicularly magnetized multilayers.** *I. Lemesh*[1] and G. Beach[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

9:18

AC-05. **Spin wave spectrum under parametric excitation on a skyrmion.** X. Chen[1], *W. Kang*[1] and W. Zhao[1] *1. Beihang University, Beijing, China*

9:30

AC-06. **Collective excitations in a skyrmion-bubble lattice stabilized in an antidot lattice.** *A. Laurenson*[1], A. Marchenko[2], V. Krivoruchko[2], J. Bertolotti[1] and V.V. Kruglyak[1] *1. Physics & Astronomy, University of Exeter, Exeter, United Kingdom; 2. Donetsk Institute for Physics and Engineering, Kiev, Ukraine*

9:42

AC-07. **Chiral Spintronics.** ***(Invited)*** *S. Yang*[1] *1. IBM Research - Almaden, San Jose, CA, United States*

10:18

AC-08. **Temperature dependence of chiral spin structure dynamics.** K. Litzius[1,2], J. Leliaert[3], P. Bassirian[1], S. Kromin[1], J. Zazvorka[1], I. Lemesh[4], *N. Kerber*[1,2], D. Heinze[1], N. Keil[1], R.M. Reeve[1,2], M. Weigand[5], G.A. Schütz[5], G. Beach[4] and M. Kläui[1,2] *1. Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 3. Department of Solid State Sciences, Ghent University, Ghent, Belgium; 4. Department of Materials Science and Engineering, MIT, Boston, MA, United States; 5. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

10:30

AC-09. **Current-induced distortion of magnetic bubbles in out-of-plane anisotropy thin layers.** *M. Nsibi*[1], J. Nath[1], I. Joumard[1], S. Auffret[1], I. Miron[1] and G. Gaudin[1] *1. SPINTEC, CEA-INAC/CNRS/Université Grenoble Alpes, Grenoble, France*

10:42

AC-10. Enhancement of domain wall velocity in He+ irradiated W-CoFeB-MgO films with perpendicular anisotropy. *X. Zhao*[1,2], N. Vernier[2], L. Herrera Diez[2], M. Sall[2], C. Hepburn[2], G. Durin[3], A. Casiraghi[3], M. Belmeguenai[4], Y. Roussigné[4], A. Stashkevich[4], S. Cherif[4], J. Langer[5], B. Ocker[5], W. Zhao[1] and D. Ravelosona[2] *1. Fert Beijing Institute, Beihang University, Beijing, China; 2. Centre de Nanosciences et de Nanotechnologies, Université Paris-Sud, Orsay, France; 3. Istituto Nazionale di Ricerca Metrologica, Turin, Italy; 4. Université Paris 13, Villetaneuse, France; 5. Singulus Technology AG, Kahl am Main, Germany*

10:54

AC-11. The role of the Oersted field in current-induced domain-wall motion in circular cross-section nanowires and tubes. A. De Riz[1], M. Schöbitz[1,2], S. Martin[1,2], C. Thirion[2], L. Cagnon[2], J. Vogel[2], M. Foerster[3], L. Aballe[3], A. Locatelli[4], T.O. Mentes[4], S. Bochmann[5], J. Bachmann[5], J. Toussaint[2], O. Fruchart[1] and *D. Gusakova*[1] *1. Univ. Grenoble Alpes, CNRS, CEA, Grenoble INP, INAC-SPINTEC, Grenoble, France; 2. Univ. Grenoble Alpes, CNRS, Institut Néel, Grenoble, France; 3. Alba Synchrotron Light Facility, CELLS, Barcelona, Spain; 4. Elettra-Sincrotrone Trieste, S.C.p.A., Trieste, Italy; 5. Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany*

11:06

AC-12. Simulation of Optical Reversal and Domain Wall Displacement Using the Landau Lifshitz Lambda Model. *M. Menarini*[2], R. Medapalli[2], V. Lomakin[2] and S. Mangin[1] *1. Université de Lorraine, Nancy, France; 2. University of California San Diego, La Jolla, CA, United States*

11:18

AC-13. Magnetoelastic spin wave excitation in non-uniform magnetized waveguides. F. Vanderveken[1,2], *F. Ciubotaru*[1], M. Heyns[1], B. Soree[1], I.P. Radu[1] and C. Adelmann[1] *1. Imec, Leuven, Belgium; 2. Faculty of Engineering, KU Leuven, Leuven, Belgium*

Session AD
EXCHANGE BIAS
Roy Chantrell, Chair
University of York, York, United Kingdom

8:30

AD-01. **Phase Boundary Exchange Coupling in the Mixed Magnetic Phase of a B2-Ordered FeRh Epilayer.** ***(Invited)*** *J. Massey*[1], K. Matsumoto[2], M. Strungaru[3], R.C. Temple[1], T. Higo[2], K. Kondou[4], R.F. Evans[3], R.W. Chantrell[3], Y. Otani[2,4] and C.H. Marrows[1] *1. Condensed Matter Physics, University of Leeds, Leeds, United Kingdom; 2. Institute of Solid State Physics, Kashiwa, Japan; 3. University of York, York, United Kingdom; 4. RIKEN, Wako, Japan*

9:06

AD-02. **Giant exchange bias in antiferromagnetic bulk Mn_3In.** B. Giri[1] and *A.K. Nayak*[1] *1. National Institute of Science Education and Research, Bhubaneswar, India*

9:18

AD-03. **Exchange Bias in CoO/Fe(110) Bilayers: a Ferromagnet Drives an Antiferromagnet.** *M. Slezak*[1], P. Drozdz[1], K. Matlak[1], J. Korecki[1,2] and T. Slezak[1] *1. AGH University of Science and Technology, Krakow, Poland; 2. Jerzy Haber Institute of Catalysis and Surface Chemistry PAS, Krakow, Poland*

9:30

AD-04. **Asymmetric Magnetization Reversal in Exchange Coupled FePt/FeCo/CoO_X/FeCo Multilayer.** *S. Singh*[1] and D. Kumar[1] *1. In-situ thin film lab, UGC-DAE Consortium for Scientific Research, INDORE, India*

9:42

AD-05. **Spin structure of the epitaxial Fe/FeO bi- and multi-layers.** *A. Koziol-Rachwal*[1], W. Janus[1], M. Szpytma[1], P. Drozdz[1], M. Slezak[1], T. Slezak[1], M. Szczepanik-Ciba[1,2], K. Freindl[2], N. Spiridis[2] and J. Korecki[1,2] *1. AGH University of Science and Technology, Krakow, Poland; 2. Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Krakow, Poland*

9:54

AD-06. **Ion Implantation Induced Exchange Bias in bcc Fe Thin Film.** *R. Gupta*[3], S. Sen[3], A. Gupta[1] and V. Reddy[2] *1. Center for Spintronic Materials, Amity University, Noida, India; 2. UGC DAE CSR Indore Cnetre, Indore, India; 3. School of Instrumentation, Devi Ahilya University, Indore, India*

10:06

AD-07. Improved Exchange Bias and Blocking Temperature of PtCr/PtMn bilayer Antiferromagnets. *M. Saito*[1] and F. Koike[1] *1. Alps Electric Co., LTD., Engineering Headquarters, Nagaoka, Japan*

10:18

AD-08. Magnetic domain texture and the Dzyaloshinskii-Moriya interaction in systems with perpendicular exchange bias. *R.A. Khan*[1], H. Nembach[2], M. Ali[1], J.M. Shaw[2], C.H. Marrows[1] and T.A. Moore[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Quantum Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO, United States*

10:30

AD-09. In-plane and out-of-plane exchange bias effects induced by noncollinear antiferromagnetic Mn_3Ge and Fe doped Mn_3Ga thin films. T. Ogasawara[1,2], J. Kim[3], M. Tsunoda[4], Y. Ando[1,5] and *A. Hirohata*[2] *1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. Department of Electronic Engineering, University of York, York, United Kingdom; 3. Department of Physics, University of York, York, United Kingdom; 4. Department of Electronic Engineering, Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network, Sendai, Japan*

10:42

AD-10. Temperature Dependent Coupling in Spin Valves Whose Interlayer Undergoes a Magnetic Phase Transition. *K. Repa*[1], B.J. Kirby[2] and C. Miller[1] *1. School of Chemistry and Materials Science, Rochester Institute of Technology, Rochester, NY, United States; 2. National Institute of Standards and Technology, Gaithersburg, MD, United States*

10:54

AD-11. Magnetic Properties Study of FeMn/NiFe Bilayers: Dependence on Ferromagnetic Layer Thickness. *Y. Liu*[1], Z. Lan[1], K. Sun[1], Z. Yu[1], R. Guo[1], X. Jiang[1] and C. Wu[1] *1. School of Materials and Energy, University of Electronic Science and Technology of China, Chengdu, China*

11:06

AD-12. Interlayer exchange coupling across RuFe alloys. *Z. Nunn*[1], F. Schultz[2], E.J. Goering[2], P. Nagel[3], S. Schuppler[3] and E. Girt[1] *1. Simon Fraser University, Burnaby, BC, Canada; 2. Max-Planck-Institute for Intelligent Systems, Stuttgart, Germany; 3. Karlsruhe Institute of Technology, Karlsruhe, Germany*

11:18

AD-13. Exchange bias in perovskite $NaNiF_3$ thin films. *S.A. Morley*[1], H. Marquez[1], A. KC[1] and D. Lederman[1] *1. Physics, University of California Santa Cruz, Santa Cruz, CA, United States*

Session AE
MAGNETO-CALORIC MATERIALS I
Martino LoBue, Chair
CNRS, Cachan, France

8:30

AE-01. **AC Susceptibility study of overlapping thermomagnetic transitions in NiMnIn Heusler alloy.** Á. Díaz-García[1], J. Law[1], *V. Franco*[1], A. Conde[1] and A. Giri[2] *1. Universidad de Sevilla, Sevilla, Spain; 2. Weapons and Materials Research Directorate, US Army Research Laboratory, Aberdeen, MD, United States*

8:42

AE-02. **Giant magnetocaloric effect in Ni-Mn based shape memory alloys.** *A.K. Pathak*[1], H.N. Bez[1,2], Y. Mudryk[1], N. Zarkevich[1], A. Biswas[1], X. Liu[1], V. Balema[1], D. Johnson[1,3] and V.K. Pecharsky[1,3] *1. Ames Laboratory of the US Department of Energy, Ames, IA, United States; 2. Mechanical Engineering, Federal University of Santa Catarina, Polo – Research Laboratories for Emerging Technologies in Cooling and Thermophysics, Florianopolis, Brazil; 3. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

8:54

AE-03. **Investigation of Magnetocaloric effect in $Ni_2Mn_{1+x}In_{1-x}$ compounds for room-temperature magnetic refrigeration.** B.R. Dahal[1], *C. Huber*[1], K. Schroeder[1], W. Zhang[2], Y. Huh[1], P.R. Kharel[1] and D.J. Sellmyer[2] *1. Physics, South Dakota State University, Brookings, SD, United States; 2. Physics and Astronomy, University of Nebraska, Lincoln, NE, United States*

9:06

AE-04. **Field dependence of magnetocaloric effect as a fingerprint of first-order phase transition.** ***(Invited)*** *J. Law*[1], V. Franco[1] and A. Conde[1] *1. Condensed Matter Physics, Sevilla University, Sevilla, Spain*

9:42

AE-05. **Magnetocaloric effect in MnNiSi-Fe_2Ge and (Mn,Fe)Ni(Si,Sn) alloys.** *D. Kamble*[1,2] and R.V. Ramanujan[1,2] *1. School of Materials Science and Engineering, Nanyang Technological University, Singapore 639798, Singapore; 2. Singapore-HUJ Alliance for Research and Enterprise (SHARE), Nanomaterials for Energy and Energy-Water Nexus (NEW), Campus for Research Excellence and Technological Enterprise (CREATE), Singapore - 138602, Singapore*

9:54

AE-06. **Wide structural and magnetic successive transitions and related magnetocaloric properties in directionally solidified polycrystalline Ni-Co-Mn-In.** F. Chen[1], *J.L. Sanchez Llamazares*[2], C. Sanchez-Valdes[3] and P. Müllner[4] *1. Harbin Engineering University, Harbin, China; 2. Instituto Potosino de Investigación Científica y Tecnológica A.C., San Luis Potosí, Mexico; 3. Universidad Autónoma de Ciudad Juárez, Ciudad Juárez, Mexico; 4. Boise State University, Boise, ID, United States*

10:06

AE-07. **Magnetocaloric effect and solid hydriding of La(Fe, Si)$_{13}$ powders through decomposing YH_2 hydride.** N. Tian[1], N. Yang[1], Y. Zhang[1], H. Fu[1], L. Ma[1], *C. You*[1], J. He[2] and Y. Li[1] *1. Xi'an University of Technology, Xi'an, China; 2. Division of Functional Materials, Central Iron and Steel Research Institute, Beijing, China*

10:18

AE-08. **Effects of Al and Fe solubility on the magnetocaloric properties of $AlFe_2B_2$.** *B. Lejeune*[1], D. Schlagel[2], B. Jensen[2], T.A. Lograsso[2], M.J. Kramer[2] and L.H. Lewis[1] *1. Chemical Engineering, Northeastern University, Boston, MA, United States; 2. Division of Materials Science and Engineering, U.S. Department of Energy Ames Laboratory, Ames, IA, United States*

10:30

AE-09. **Computational and experimental design of magnetocalorics with large magnetostructural coupling.** *J.D. Bocarsly*[1], E.E. Levin[1], J.A. Cooley[1], J.H. Grebenkemper[1], S.D. Wilson[1] and R. Seshadri[1] *1. Materials Research Laboratory, UC Santa Barbara, Santa Barbara, CA, United States*

10:42

AE-10. **Influence of the Ge distribution on the first order magnetic transition of the MnFePGe magnetocaloric materials.** *D. Liu*[1], S. Wang[1], Z. Zhang[1] and H. Li[1] *1. Institute of Microstructure and Property of Advanced Materials, Beijing University of Technology, Beijing, China*

10:54

AE-11. **Optimizing Magnetocaloric Material for Thermomagnetic Energy Harvesting.** *M. Almanza*[1,2] and M. LoBue[1] *1. SATIE, ENS Cachan, CNRS, Université Paris-Saclay, Cachan, France; 2. LAI, École Polytechnique Fédérale de Lausanne (EPFL), Neuchâtel, Switzerland*

11:06

AE-12. **Ultra-low-field magneto-elastocaloric cooling in a multiferroic composite device.** H. Hou[2], *P. Finkel*[1], M. Staruch[1], J. Cui[3] and I. Takeuchi[2] *1. Naval Research Laboratory, Washington, DC, United States; 2. University of Maryland, College Park, MD, United States; 3. Ames Laboratory, Ames, IA, United States*

11:18

AE-13. **Magnetic and Magnetocaloric Properties of $Pr_{2-x}Nd_xFe_{15}$ Alloys.** *P.R. Kharel*[1], T. Ott[1], W. Zhang[2], B.R. Dahal[1], S. Valloppilly[3], X. Li[3] and D.J. Sellmyer[2] *1. Physics, South Dakota State University, Brookings, SD, United States; 2. Physics and Astronomy, University of Nebraska, Lincoln, NE, United States; 3. Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, United States*

TUESDAY MORNING 8:30 — DELAWARE

Session AF

SOFT MAGNETIC MATERIALS I: FERRITES, GARNETS AND OTHERS

Shin Yabukami, Co-Chair
Tohoku University, Sendai, Japan
Alexander Sokolov, Co-Chair
Northeastern University, Burlington, MA, United States

8:30

AF-01. **Magnetostriction of Iron-Gallium Alloys Revisited.** *J. Steiner*[1], A. Lisfi[2], L. Salamanca-Riba[1], J. Cumings[3] and M. Wuttig[1] *1. Materials Science, University of Maryland, College Park, MD, United States; 2. Physics, Morgan State University, Baltimore, MD, United States*

8:42

AF-02. **Suppression of anisotropy and inversion symmetry effects by magnetic charge density points to better motors.** *A.S. Arrott*[1] and T.L. Templeton[1] *1. Physics, Simon Fraser University, Burnaby, BC, Canada*

8:54

AF-03. **A New Power MnZn Ferrite for Broad Temperature Range Applications.** *V. Tsakaloudi*[1], G. Kogias[1] and V.T. Zaspalis[1,2] *1. Chemical Processes and Energy Resources Institute CPERI, Centre for Research and Technology Hellas CERTH, Thermi, Greece; 2. Department of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece*

9:06

AF-04. **3D Structure Design of Magnetic Ferrite Cores Using Gelcasting and Pressure-less Sintering Process.** B. Ahmadi[1], L. Empringham[1], L. De Lillo[1] and *A. Stratta*[1] *1. PEMC, University of Nottingham, Nottingham, United Kingdom*

9:18

AF-05. **Thermal Transport Properties of Fe-Co Alloys.** G. Kozlowski[2,1], M.A. Susner[2,3], *J. Horwath*[2] and Z. Turgut[2] *1. Physics, Wright State University, Dayton, OH, United States; 2. Air Force Research Laboratory, Wright-Patterson AFB, OH, United States; 3. UES Inc., Dayton, OH, United States*

9:30

AF-06. **Brillouin Light Scattering Measurements of Exchange Stiffness as a Function of Composition in Copper-Permalloy Alloys.** *N.T. Sorensen*[1], P. Kabos[2], R.E. Camley[1] and Z. Celinski[1] *1. Dept of Physics, University of Colorado at Colorado Springs, Colorado Springs, CO, United States; 2. NIST, Boulder, CO, United States*

9:42

AF-07. **The application of macroscopic flakes for Fe-6.5%Si bulk magnetics with superior magnetic properties.** *G. Ouyang*[1,2], B. Jensen[2], K.W. Dennis[2], W. Tang[2], B. Cui[2] and J. Cui[1,2] *1. Materials Science and Engineering, Iowa State University, Ames, IA, United States; 2. Ames Laboratory, Ames, IA, United States*

9:54

AF-08. **The study of the particle sizes fractions effects on the SMC materials.** *E. Poskovic*[1,2], L. Ferraris[1], F. Franchini[1] and M. Actis Grande[1] *1. Politecnico di Torino, Alessandria, Italy; 2. Università degli Studi di Padova, Padova, Italy*

10:06

AF-09. **The Thickness and Growth Temperature Dependences of Soft Magnetic Properties and an Effective Damping Parameter of (FeCo)-Si Alloy Thin Films.** *K. Abe*[1,2], S. Wu[1], Y. Tanaka[2], Y. Ariake[2], I. Kanada[2], T. Mewes[1], G.J. Mankey[1], C.K. Mewes[1] and T. Suzuki[1] *1. The Center for Materials for Information Technology, The University of Alabama, Tuscaloosa, AL, United States; 2. Materials Development Center, TDK Corporation, Narita, Japan*

10:18

AF-10. **FeCr alloys damage observed through magnetic domain structure after self-ions irradiation under an external magnetic field.** *J.F. Cuñado*[1], A. Moroño[2], F. Sanchez[2], P. Muñoz[2], J. Camarero[1] and I. Garcia-Cortes[2] *1. Nanomagnetism, IMDEA Nanociencia, Madrid, Spain; 2. Laboratorio Nacional de Fusion, CIEMAT, Madrid, Spain*

10:30

AF-11. **Off-equimolar Multiple Component Alloys: Phase and Magnetic Behaviour Evolution in $CoFeCr_{0.5}Ni_{0.5}$-Al_x (x: 0, 0.5, 1.0, and 1.5).** C.R. Lim[1], Z. Leong[1] and *N. Morley*[1] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom*

10:42

AF-12. **Electronic Structure of Nanocrystalline Fe-Co-B-P-Cu Soft Magnet: New Calculation Methodology.** *M. Choi*[1], Y. Hong[1], W. Lee[1], H. Won[1], C. Turner[4], D. Choi[2], S. Bae[2] and S. Kim[3] *1. Department of Electrical and Computer Engineering and MINT Center, The University of Alabama, Tuscaloosa, AL, United States; 2. LG Innotek, Seoul, The Republic of Korea; 3. Department of Physics and Astronomy and Center for Computational Sciences, Mississippi State University, Starkville, MS, United States; 4. Department of Chemical Engineering, The University of Alabama, Tuscaloosa, AL, United States*

10:54

AF-13. **Effect of Ferric ion on the Magnetic Properties and Curie Temperature of MFe_2O_4 (Fe, Co and Mn) Ferrites.** *A. Thirumurugan*[1], J. Joseyphus[2], R. Ponraj[2] and A. Fakhrabadi[1] *1. Physics and Mathematics (Mechanical), University of Chile, Santiago, Chile; 2. Physics, National Institute of Technology, Tiruchirappalli, India*

11:06

AF-14. **Growth Temperature Dependence of Magnetic Anisotropy for CoFe Films.** *W. Zhu*[1], Z. Zhu[1], H. Xue[1], G. Wu[1], Q. Jin[1] and Z. Zhang[1] *1. Department of Optical Science and Engineering, Fudan University, Shanghai, China*

11:18

AF-15. **Synthesis of γ′-Fe_4N Powder in Liquid Nitrogen.** Y. Jiang[2,3] and *L. Jiang*[1] *1. Chemical Engineering, UC Berkeley, Berkeley, CA, United States; 2. Microelectronics, Jiangnan University, Wuxi, China; 3. Electrical & Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

TUESDAY MORNING 8:30 — WASHINGTON 1

Session AG
MAGNETORESISTIVE EFFECTS FOR SENSOR APPLICATIONS

Steven Bennett, Chair
U.S. Naval Research Laboratory, Washington, DC, United States

8:30

AG-01. **A magnetoresistive sensor for wide-dynamic-range magnetic field measurements.** X. Yin[1,2], Y. Yang[1,3], Y. Liu[1,3], D. Ewing[4], P.J. De Rego[4] and *S. Liou*[1,3] *1. NCMN, University of Nebraska, Lincoln, NE, United States; 2. Western Digital, Fremont, CA, United States; 3. Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, United States; 4. Department of Energy's National Security Campus, Kansas City, MO, United States*

8:42

AG-02. **Realization of Full-Wheatstone-Bridge GMR Sensors by One-time Thermal Annealing Process.** *S. Yan*[1], Z. Cao[1], Z. Guo[1], Z. Li[1], Q. An[1], W. Zhao[1] and Q. Leng[1] *1. Beihang-Goertek Joint Microelectronics Institute, Qingdao Research Institute, Beihang University, Qingdao, China*

8:54

AG-03. **Reconfigurable Wheatstone Bridge spintronic sensors with Offset Voltage Compensation at Wafer Level.** *F. Franco*[1,2], S. Cardoso de Freitas[1,2] and P.P. Freitas[1] *1. INESC-MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal*

9:06

AG-04. A New TMR-Sensor-Based Detection Approach for Overhead Transmission System. Q. Xu[2], *C. Liu*[1], X. Liu[2] and P. Pong[2] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong, Hong Kong; 2. Department of Electrical and Electronic Engineering, University of Hong Kong, Hong Kong, Hong Kong*

9:18

AG-05. Characterization of MgO-based magnetic tunnel junctions with superparamagnetic freelayers. *J.E. Davies*[1], B. Vavra[2], D. Huang[2], M.A. Torija[1] and P. Eames[1] *1. Advanced Technology, NVE Corporation, Eden Prairie, MN, United States; 2. NVE Corporation, Eden Prairie, MN, United States*

9:30

AG-06. Paramagnetic Molecule Producing Strong Inter-Ferromagnetic Electrode Coupling and Current Suppression on a Magnetic Tunnel Junction. *P. Tyagi*[1,2], C. Riso[1], T. Goulet[1] and C. Beckett[3] *1. Mechanical Engineering, University of the District of Columbia, Washington, DC, United States; 2. Chemical and Materials Engineeing, University of Kentucky, Lexington, KY, United States; 3. Electrical Engineering, University of the District of Columbia, Washington, DC, United States*

9:42

AG-07. Magnetic Sensors: Taxonomy, Applications and New Trends. ***(Invited)*** *E. Hristoforou*[1] *1. Laboratory of Electronic Sensors, National Technical University of Athens, Athens, Greece*

10:18

AG-08. Optimization of the gap size of flux-concentrators: pushing further on low noise levels and high sensitivities in spin-valve sensors. *M.D. Silva*[1,2], J.F. Silva[1,2], D.C. Leitao[1,2], S. Cardoso de Freitas[1,2] and P.P. Freitas[1] *1. INESC-MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal*

10:30

AG-09. Temperature Dependence of Noise in Giant- and Tunneling Magnetoresistive Vortex Sensors. *H. Weitensfelder*[1], H. Brueckl[3], A. Satz[2] and D. Suess[1] *1. Physics of Functional Materials, University of Vienna, Vienna, Austria; 2. Infineon Technologies Austria AG, Villach, Austria; 3. Department for Integrated Sensor Systems, Danube University Krems, Wiener Neustadt, Austria*

10:42

AG-10. Negative Resistance and Amplification of Microwave in Heat-driven Magnetic Tunnel Junctions. *M. Goto*[1,3], Y. Wakatake[1], U.K. Oji[1], S. Miwa[1,3], N. Strelkov[4,5], B. Dieny[4], H. Kubota[2], K. Yakushiji[2], A. Fukushima[2], S. Yuasa[2] and Y. Suzuki[1,3] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; 3. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 4. University of Grenoble Alpes, Grenoble, France; 5. Moscow Lomonosov State University, Moscow, Russian Federation*

10:54

AG-11. **Large MR Ratio by Using Metastable bcc-Cu Spacer Layer in Epitaxial Current In-Plane Giant Magnetoresistance Devices.** *K.B. Fathoni*[1,2*], Y. Sakuraba[1], T. Sasaki[1], Y. Miura[1], T. Nakatani[1] and K. Hono[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. University of Tsukuba, Tsukuba, Japan*

TUESDAY
MORNING
8:30

WASHINGTON 2

Session AH
CORRELATED NANOPARTICLES AND NANOWIRES
Julie Borchers, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

8:30

AH-01. **New Magnetic Orders, and Phase Diagram Exploration in Artificial Spin Systems. *(Invited)*** *J. Sklenar*[1], Y. Lao[1], A. Albrecht[2], J.D. Watts[2], J. Park[1], B.L. Le[1], F. Caravelli[3], M. Sheikh[1], D. Gardeazabal[1], A. Scholl[4], K. Dahmen[1], C. Leighton[2], G. Chern[5], C. Nisoli[3] and P. Schiffer[6,1] *1. University of Illinois at Urbana-Champaign, Urbana, IL, United States; 2. University of Minnesota, Minneapolis, MN, United States; 3. Los Alamos National Laboratory, Los Alamos, NM, United States; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. University of Virginia, Charlottesville, VA, United States; 6. Yale University, New Haven, CT, United States*

9:06

AH-02. **The effect of geometry on ordering and correlations in Artificial Spin Ice.** *G.M. Macauley*[1], R. Macedo[1], Y. Li[1], G. Paterson[1], R. Stamps[2] and S. McVitie[1] *1. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 2. Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada*

9:18

AH-03. **Dynamics of emergent magnetic monopoles in ferromagnetic nanoparticles.** *M. Charilaou*[1,2], H. Braun[3] and J.F. Löffler[1] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Department of Physics, University of Louisiana at Lafayette, Lafayette, LA, United States; 3. School of Physics, University College Dublin, Dublin, Ireland*

9:30

AH-04. **Optimizing Thermalization of Square Artificial Spin Ice.** *X. Zhang*[1,2], Y. Lao[2,3], J. Sklenar[2,3], N.S. Bingham[1], J.D. Watts[4,5], C. Leighton[4] and P. Schiffer[1,2] *1. Applied Physics, Yale University, New Haven, CT, United States; 2. Physics, University of Illinois Urbana and Champaign, Urbana, IL, United States; 3. Frederick Seitz Materials Research Laboratory, University of Illinois Urbana and Champaign, Urbana, IL, United States; 4. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 5. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States*

9:42

AH-05. **Macroscopic flexible spin-caloritronic devices based on interconnected nanowire networks.** *T. da Câmara Santa Clara Gomes*[1], F. Abreu Araujo[1] and L. Piraux[1] *1. Institute of Condensed Matter and Nanosciences, Université catholique de Louvain, Louvain-La-Neuve, Belgium*

9:54

AH-06. **Modulated anisotropy in multisegmented CoNi/Ni cylindrical nanowires.** *M. Vázquez*[1], C. Bran[1], J. Fernandez-Roldan[1], R. Perez del Real[1], O. Chubykalo-Fesenko[1] and A. Asenjo[1] *1. Institute of Materials Science of Madrid, CSIC, Madrid, Spain*

10:06

AH-07. **Effect of Applied AC Magnetic Field on Response of Magnetic Nanoparticles.** *C. Dennis*[1], M. Bleuel[1], C.A. Glinka[1], J. Borchers[1], C. Gruettner[2] and R. Ivkov[3] *1. NIST, Gaithersburg, MD, United States; 2. Micromod Partikeltechnologie GmbH, Rostock-Warnemuende, Germany; 3. Department of Radiation Oncology and Molecular Radiation Sciences, The Johns Hopkins University School of Medicine, Baltimore, MD, United States*

10:18

AH-08. **Size-dependent magnetic correlations in Fe_3O_4 nanoparticle assemblies revealed by X-rays.** *K. Chesnel*[1], J. Rackham[1], B. Newbold[1], S. Kottter[1] and R. Harrison[2] *1. Physics, BYU, Provo, UT, United States; 2. Chemistry, BYU, Provo, UT, United States*

10:30

AH-09. **Fabrication and characterisation of a three-dimensional magnetic nanowire lattice.** *A. May*[1], M. Hunt[1], A. Van Den Berg[1], A. Hejazi[1] and S. Ladak[1] *1. Physics and Astronomy, Cardiff University, Cardiff, United Kingdom*

10:42

AH-10. **Magnetic Properties of Metallic Metalattices.** *S. Kempinger*[1], Y. Liu[1], P. Mahale[1], P. Moradifar[1], T. Mallouk[1], S. Mohney[1], N. Alem[1], J. Badding[1] and N. Samarth[1] *1. Penn State University, State College, PA, United States*

10:54

AH-11. **Magnetic spin structures in chemically homogeneous manganese ferrite nanoparticle assemblies.** *Y. Ijiri*[1], A.M. Abdelgawad[2], J. Zhang[3], Q. Zhang[3], X. Zhang[3], K.L. Krycka[4], J. Borchers[4], J. Rhyne[4] and S. Majetich[5] *1. Physics and Astronomy, Oberlin College, Oberlin, OH, United States; 2. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Materials Science and Engineering, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia; 4. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 5. Physics, Carnegie Mellon University, Pittsburgh, PA, United States*

11:06

AH-12. **Spin Waves Across 3-Dimensional, Close-Packed Nanoparticles.** *K.L. Krycka*[1], J. Rhyne[1], S.D. Oberdick[2], A.M. Abdelgawad[3], J. Borchers[1], Y. Ijiri[4], S. Majetich[3] and J.W. Lynn[1] *1. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Applied Physics, National Institute of Standards and Technology, Boulder, CO, United States; 3. Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 4. Physics and Astronomy, Oberlin College, Oberlin, OH, United States*

11:18

AH-13. **Clickable Superparamagnetic Iron Oxide Nanoparticles for the Assembly of Magnetic Nanoring Structures on Viral Templates.** *S. Cross*[1], K.V. Korpany[1], D. Petrescu[1], S. Abi Farraj[2] and A. Blum[1] *1. Chemistry, McGill University, Montreal, QC, Canada; 2. Materials Science, McGill University, Montreal, QC, Canada*

TUESDAY
MORNING
8:30

WASHINGTON 5

Session AI
ENERGY ASSISTED MAGNETIC RECORDING I

Chris Rea, Chair
Seagate Technology, Bloomington, MN, United States

8:30

AI-01. **All optical switching in ferromagnetic layer: From multiple to single laser pulse.** ***(Invited)*** *S. Mangin*[1], M. Hehn[1], G. Malinowski[1] and J. Gorchon[1] *1. Institut Jean Lamour, Université de Lorraine, Nancy, France*

9:06

AI-02. **Micromagnetic Modelling of Helicity-Dependent Laser Induced Domain Wall Motion in Ferromagnetic Thin Films.** A. Hernandez[1], M. Zazo[1], E. Martinez[1] and *V. Raposo*[1] *1. Fisica Aplicada, University of Salamanca, Salamanca, Spain*

9:18

AI-03. **All-optical magnetization switching in spin-valve structure mediated by spin-polarized hot electron transport.** *S. Iihama*[2,1], Y. Xu[2], M. Deb[2], G. Malinowski[2], M. Hehn[2], J. Gorchon[2], E. Fullerton[2,3] and S. Mangin[2] *1. AIMR, Tohoku University, Sendai, Japan; 2. Institut Jean Lamour, Université de Lorraine, Vandoeuvre-lès-Nancy, France; 3. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States*

9:30

AI-04. **Implementation of the HAMR process for an exchange coupled composite media at significantly low recording and write temperatures.** *N.A. Natekar*[1], W. Tipcharoen[1,2] and R.H. Victora[1] *1. Electrical & Computer Engineering, University of Minnesota, Twin Cities, Minneapolis, MN, United States; 2. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand*

9:42

AI-05. **Characterizing Curvature in Heat Assisted Magnetic Recording using Spin Stand Imaging.** *I. Gilbert*[1], Z. Liu[1], D.A. Saunders[2], W.R. Eppler[1], C.J. Rea[2] and T. Rausch[1] *1. Seagate Research, Seagate Technology, Shakopee, MN, United States; 2. Recording Head Operations, Seagate Technology, Bloomington, MN, United States*

9:54

AI-06. **Magnetic Field Effects in Heat Assisted Magnetic Recording.** *Z. Liu*[1], S. Hernandez[1], I. Gilbert[1], H. Zhou[2], C.J. Rea[2], P. Huang[2], G. Ju[2] and T. Rausch[1] *1. Seagate Research, Seagate Technology, Shakopee, MN, United States; 2. Seagate Technology, Bloomington, MN, United States*

10:06

AI-07. **Variation in Optical Absorption of Heat Assisted Magnetic Recording Media.** *A. Ghoreyshi*[1] and R.H. Victora[1] *1. Electrical Engineering, University of Minnesota, Minneapolis, MN, United States*

10:18

AI-08. **Viscoelastic Lubricant Deformation and Disk-to-Head Transfer during Heat-Assisted Magnetic Recording (HAMR).** *S. Sakhalkar*[1] and D. Bogy[1] *1. Mechanical Engineering, University of California Berkeley, Berkeley, CA, United States*

10:30

AI-09. **Adjacent track interference in heat assisted magnetic recording: impact and implications.** *S.S. Kalarickal*[1], A. Tsoukatos[1], S. Hernandez[1], S. Granz[1], C. Hardie[1] and E.C. Gage[1] *1. Seagate Research Group, Seagate Technology, Shakopee, MN, United States*

10:42

AI-10. **Limiting Factors for Linear Density Capability in Heat-Assisted Magnetic Recording.** *Y. Qin*[1] and J. Zhu[1] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

10:54

AI-11. **Recording noise due to intergrain spin transfer torque caused by huge local thermal gradients in heat assisted magnetic recording (HAMR).** *B. Dieny*[1], M. Chshiev[1], B. Charles[1], N. Strelkov[1,2], A. Truong[1], O. Fruchart[1], A. Hallal[1], J. Wang[3], Y. Takahashi[3], T. Mizuno[4] and K. Hono[3] *1. INAC-Spintec, Univ.Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France; 2. Department of Physics, Lomonosov Moscow State University, Moscow, Russian Federation; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan; 4. TDK/Headway, Milpitas, CA, United States*

11:06

AI-12. **Transition Jitter, Switching Probability and Curvature Reduction dependency of the Signal-to-Noise Ratio in Heat-Assisted Magnetic Recording.** *F. Slanovc*[1], C. Vogler[1], O. Muthsam[1] and D. Suess[1] *1. Physics of Functional Materials, University of Vienna, Vienna, Austria*

11:18

AI-13. **Electronic Structure of Ferromagnetic Carbon-doped Fe-Pt for HAMR.** *M. Choi*[1], Y. Hong[1], H. Won[1], W. Lee[1], C. Yeo[2], D.S. Kuo[3] and J. Thiele[3] *1. Department of Electrical and Computer Engineering and MINT Center, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Mechanical Engineering, Texas Tech University, Lubbock, TX, United States; 3. Seagate Technology LLC, Fremont, CA, United States*

TUESDAY
MORNING
9:30

EXHIBIT HALL A

Session AJ

SPIN HALL EFFECT, SPIN INJECTION AND RELATED EFFECTS (Poster Session)

Peng Li, Chair
Stanford University, Palo Alto, CA, United States

AJ-01. **All-Optical Determination of Thickness-Dependent Spin Hall Angle of β-Tantalum in Ta/CoFeB/SiO_2 Heterostructure.** S. Mondal[1], A. De[1], S. Choudhury[1], *A.K. Chaurasiya*[1], J. Sinha[1] and A. Barman[1] *1. Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata, India*

AJ-02. **All-optical detection of interfacial spin transparency by spin pumping induced modulation of damping in CoFeB/β-Ta thin films.** S.N. Panda[1], S. Mondal[1], S. Choudhury[1], *A.K. Chaurasiya*[1], J. Sinha[1] and A. Barman[1] *1. Condensed Matter Physics and Material Sciences, S N Bose National Centre for Basic Sciences, Kolkata, India*

AJ-03. **Large enhancement of the effective spin Hall angle of Pt by metallic nanoparticles of Ag and Cu.** *O. Alves-Santos*[1], M. Gamino[1], E.F. Silva[1], J.B. Mendes[2], R. Rodriguez[3], F.L. Machado[1], S.M. Rezende[1] and A. Azevedo[1] *1. Departamento de Física, Universidade Federal de Pernambuco, Recife, Brazil; 2. Departamento de Física, Universidade Federal de Viçosa, Viçosa, Brazil; 3. Facultad de Física, Pontifícia Universidad Católica de Chile, Santiago, Chile*

AJ-04. **Giant spin Hall signals observed in CoFe/Pt nanostructures.** *V. Pham*[1], I. Groen[1], E. Sagasta[1], A. Marty[2], C. Lin[3], I. Young[3], T. Gosavi[3], S. Manipatruni[3], L.E. Hueso[1,4] and F. Casanova[1,4] *1. CIC nanoGUNE, Donostia-San Sebastián, Spain; 2. SPINTEC, CEA-INAC/CNRS/Univ., Grenoble, France; 3. Components Research, Intel Corp., Hillsboro, OR, United States; 4. IKERBASQUE, Basque Foundation for Science, Bilbao, Spain*

AJ-05. **THz radiation generated from interfacial Rashba spin-orbit coupling.** *M. Jungfleisch*[1,2], Q. Zhang[3], W. Zhang[1,4], J. Pearson[1], R.D. Schaller[5,6], H. Wen[3] and A. Hoffmann[1] *1. Materials Science Division, Argonne National Laboratory, Argonne, IL, United States; 2. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 3. Advanced Photon Source, Argonne National Laboratory, Argonne, IL, United States; 4. Department of Physics, Oakland University, Rochester, MI, United States; 5. Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL, United States; 6. Department of Chemistry, Northwestern University, Evanston, IL, United States*

AJ-06. **Laser-induced THz emission in Ta/CoFeB/MgO films with different compositions.** Y. Sasaki[1,2], S. Iihama[1], K. Suzuki[1,3] and *S. Mizukami*[1,3] *1. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

AJ-07. **Spin Memory Loss in Magnetically Ordered Pt.** *P. Omelchenko*[1], E. Girt[1] and B. Heinrich[1] *1. Physics, Simon Fraser University, Burnaby, BC, Canada*

AJ-08. **Electrical detection of spin-vorticity coupling using inverse spin Hall effect.** *S. Tateno*[1], G. Okano[1] and Y. Nozaki[1,2] *1. Department of Physics, Keio univ., Yokohama, Japan; 2. Center for Spintronics Research Network, Keio University, Yokohama, Japan*

AJ-09. **Amplification of Spin Waves in Yttrium Iron Garnet Waveguides by the Spin-Hall Effect.** M. Evelt[1], *V.E. Demidov*[1], S.O. Demokritov[1], J.L. Prieto[2], M. Muñoz[3], J. Ben Youssef[4], V. Naletov[5], G. de Loubens[5], O. Klein[6], M. Collet[7], K. Garcia-Hernandez[7], P. Bortolotti[7], V. Cros[7] and A. Anane[7] *1. University of Muenster, Muenster, Germany; 2. Ciudad Universitaria, Madrid, Spain; 3. CNM-CSIC, Madrid, Spain; 4. Université de Bretagne Occidentale, Brest, France; 5. CEA Saclay, Gif-sur-Yvette, France; 6. Univ. Grenoble Alpes, Grenoble, France; 7. Université Paris-Saclay, Palaiseau, France*

AJ-10. **Nonreciprocal spin waves in spin-Hall oscillators with Dzyaloshinskii-Moriya interaction.** *R.V. Verba*[1], R. Zivieri[2], A. Giordano[2], B. Azzerboni[2], M. Carpentieri[3], A.N. Slavin[4] and G. Finocchio[2] *1. Institute of Magnetism, Kyiv, Ukraine; 2. University of Messina, Messina, Italy; 3. Politecnico di Bari, Bari, Italy; 4. Oakland University, Rochester, MI, United States*

AJ-11. **Defect-Induced Enhancement of Spin Mixing Conductance in Few-Layer MoS_2/Py.** R. Bansal[1], A. Kumar[1], N. Sisodia[1], *N. Chowdhury*[1], A. Dogra[2,3], A. Barvat[2,3], P. Pal[2,3] and P.K. Muduli[1] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India; 2. CSIR-National Physical Laboratory, New Delhi, India; 3. Academy of Scientific and Innovative Research (AcSIR), CSIR-National Physical Laboratory, New Delhi, India*

AJ-12. **Spin and valley polarized transport in strained silicene heterojunctions.** *Z. Siu*[1] and M.B. Jalil[1] *1. National University of Singapore, Singapore, Singapore*

AJ-13. **Monolayer Assembly of Chiral Molecules on Semiconductors for Spin Filtering.** *T. Liu*[1], L. Hu[1], E. Lochner[1], P. Xiong[1], X. Wang[2], J. Zhao[2], G. Shi[3], F. Gao[3] and Y. Li[3] *1. Physics, Florida State University, Tallahassee, FL, United States; 2. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; 3. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

TUESDAY
MORNING
9:30

EXHIBIT HALL A

Session AK
SPIN TRANSFER TORQUE MRAM I
(Poster Session)

Behrouz Khodadadi, Chair
Virginia Tech, Tuscaloosa, AL, United States

AK-01. **High Magnetic Anisotropy in Epitaxial MnAl Thin Films for STT-MRAM.** *M. Parvin*[1], M. Oogane[1], M. Tsunoda[2], M. Watanabe[1] and Y. Ando[1] *1. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai-shi, Japan; 2. Department of Electronic Engineering, Graduate School of Engineering, Tohoku University, Sendai-shi, Japan*

AK-02. **Effects of growth order on perpendicular magnetic anisotropy of heavy metal/ferromagnet/MgO tri-layered heterostructures.** *Y. Zhang*[1], X. Yang[1], P. Li[1,2], J. Ouyang[1] and M. Wu[2] *1. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China; 2. Department of Physics, Colorado State University, Fort Collins, CO, United States*

AK-03. **Micromagnetic study of edge-damage effects in perpendicular CoFeB/MgO Magnetic Tunnel Junction.** *C. Yoshida*[1], T. Tanaka[1], T. Ataka[1] and A. Furuya[1] *1. Application Reseach and Development Division, Fujitsu Limited, Kawasaki, Japan*

AK-04. **Stability and current-induced magnetization switching in spin-valves with composite free layers.** *V. Sluka*[1] and A.D. Kent[1] *1. Department of Physics, New York University, New York, NY, United States*

AK-05. **Withdrawn**

AK-06. **Effect of reference layer magnetic properties on storage layer switching properties with STT-MRAM.** *S. Itai*[1], T. Kai[1], J. Ozeki[1], M. Nakayama[1], J. Ito[1] and T. Ishihara[1] *1. Institute of Memory Technology Research & Development, Toshiba Memory Corporation, Kawasaki, Japan*

AK-07. **Critical role of sputtering condition for reference layer on magnetic and transport properties of perpendicular-anisotropy magnetic tunnel junction.** *H. Honjo*[1,2], S. Ikeda[1,4], H. Sato[1,4], M. Yasuhira[1,2] and T. Endoh[1,3] *1. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 2. JST ACCEL, Sendai, Japan; 3. Graduate School of Engineering, Tohoku University, Sendai, Japan; 4. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

AK-08. **Non-Switching probability with second order uniaxial anisotropy in STT-MRAM.** *E. Baek*[1] and C. You[1] *1. Department of Emerging Material Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea*

AK-09. **Effect of Nonmagnetic Impurities on the High Temperature Magnetic Properties of CoFeB Free Layers for STT-MRAM.** *J.M. Iwata-Harms*[1], G. Jan[1], H. Liu[1], S. Serrano-Guisan[1], L. Thomas[1], J. Zhu[1], R. Tong[1], V. Sundar[1] and P. Wang[1] *1. TDK - Headway Technologies, Inc., Milpitas, CA, United States*

AK-10. **Reducing the switching current with an antiferromagnetic coupling structure in nanomagnets with perpendicular anisotropy.** K. Kubota[1], K. Yamada[2] and *Y. Nakatani*[1] *1. University of Electro-Communications, Tokyo, Japan; 2. Gifu University, Gifu, Japan*

AK-11. **Low-energy switching of a FM/HM/FM sandwich structure driven by spin-orbit torque.** *S. Wang*[1], J. Luo[1], C. Zhao[1], W. Wang[1] and T. Ye[1] *1. Institute of Microelectronics, CAS, Beijing, China*

Session AL

SOFT MAGNETIC COMPONENTS: ELECTRICAL MACHINERY APPLICATIONS (Poster Session)

Satoru Simizu, Chair
Carnegie Mellon University, Pittsburgh, PA, United States

AL-01. **Design Process of Induction Motor by Equivalent Circuit Couple with Finite Element Analysis for Electrical Power Steering Application.** *S. Lee*[1] *1. Hyosung Heavy Industries Corporation, Changwon, The Republic of Korea*

AL-02. **Analysis of Coaxial Magnetic Gear's Characteristics According to Gear Ratio.** *C. Gim*[1], E. Park[1], S. Jung[2] and Y. Kim[1] *1. Chosun University, Gwangju, The Republic of Korea; 2. Sungkyunkwan University, Suwon, The Republic of Korea*

AL-03. **Torque Characteristic Analysis and Measurements of Magnetic Rack-Pinion Gear Based on Analytical Method.** *G. Jang*[1], C. Kim[1], S. Seo[1], K. Shin[1] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*

AL-04. **Optimized Design, Magnetic and Mechanical Analysis of Low Gear Ratio Magnetic Gear for Contra Rotating Propeller.** *T. Lee*[1], D. Hong[1,2], Y. Jeong[2], S. Chung[1,2] and J. Chang[3] *1. Energy and Power Conversion Engineering, University of Science and Technology, Changwon-si, The Republic of Korea; 2. Electric Motor Research Center, Korea Electrotechnology Research Institute, Changwon-si, The Republic of Korea; 3. Electrical Engineering, Dong-A University, Busan, The Republic of Korea*

AL-05. **Design and Analysis of Coaxial Magnetic Gears Considering the Mechanical Stress.** *J. Lee*[1], K. Shin[1], T. Bang[1] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*

AL-06. **Analysis and Improvement of Power Factor of Magnetic-Field Modulated Brushless Double-Rotor Machine.** *J. Bai*[1], J. Liu[1], P. Zheng[1] and Y. Liu[1] *1. Harbin Institute of Technology, Harbin, China*

AL-07. **Optimal Design and Experimental Verification of Linear Magnetic Gear.** *S. Seo*[1], C. Kim[1], G. Jang[1], J. Woo[1] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea*

AL-08. **A Study on the Design of Axial Flux Motor Using 3D Printing of Amorphous Soft Magnetic Materials.** S. Lee[1], *I. Yang*[2] and W. Kim[2] *1. Intelligent Information Technology, Busan University of Foreign Studies, Busan, The Republic of Korea; 2. Energy IT, Gachon University, Seongnam-Si, The Republic of Korea*

AL-09. **Design and Implementation of a Magnetic Press System for Creating Magnetically Self-Biased Materials.** *S.D. Johnson*[1], E. Patterson[1], S. Shin[1], S. Qadri[1], E. Gorzkowski[1] and J. Xing[1] *1. Naval Research Laboratory, Washington, DC, United States*

AL-10. **A Novel Air-cored Linear and Rotary Machine with Helical Permanent Magnet Mover.** *P. Jin*[1], Y. Guo[1], Z. Pan[2] and S. Lyu[2] *1. School of Energy and Electrical Engineering, Hohai University, Nanjing, China; 2. Southeast University, School of Electrical Engineering, Nanjing, China*

AL-11. **A Novel Air-cored Linear-Rotary Induction Machine and 3-D Hybrid Analytical Magnetic Field Analysis of Eddy Current.** *P. Jin*[1], Y. Guo[1], Z. Pan[2] and S. Lyu[2] *1. College of Energy and Electrical Engineering, Hohai University, Nanjing, China; 2. Southeast University, School of Electrical Engineering, Nanjing, China*

TUESDAY
MORNING
9:30

EXHIBIT HALL A

Session AM
NEUROMORPHIC, LOGIC, AND SPIN INJECTION DEVICES
(Poster Session)

Arnab Bose, Chair
Cornell University, Ithaca, NY, United States

AM-01. **Spintronic Synapses Based on the Angular Variation of Magnetoresistance in Magnetic Tunnel Junctions.** *M. Mansueto*[1], S. Auffret[1], I. Joumard[1], A. Chavent[1], L.D. Buda-Prejbeanu[1], I.L. Prejbeanu[1] and B. Dieny[1] *1. Univ. Grenoble Alpes / CEA / CNRS, Spintec, Grenoble, France*

AM-02. **Bipolar Random Spike Generation and Binary Random Number Generation by Two Magnetic Tunnel Junctions.** *Y. Lv*[1], B. Zink[1] and J. Wang[1] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

AM-03. **Realization of 15 Boolean Logic Functions Based on the ZnCoO-diode Combined Device.** *Z. Zheng*[1], K. Zhang[1,2], Y. Zhang[1], Z. Zhang[1] and W. Zhao[1,2] *1. Fert Beijing Research Institute, School of Electronics and Information Engineering, BDBC, Beihang University, Beijing, China; 2. Beihang-Goertek Joint Microelectronics Institute, Qingdao Research Institute, Beihang University, Qingdao, China*

AM-04. **Programmable Multi-functional Spin Logic Cell Based on Spin Hall Effect.** X. Zhang[1], C. Wan[1], W. Kong[1], C. Fang[1], H. Wu[1] and *X. Han*[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

AM-05. **Chirality Reversible SOT-Switching and Field-Free Programmable Spin Logic.** X. Wang[1], C. Wan[1], W. Kong[1], C. Fang[1], H. Wu[1] and *X. Han*[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

AM-06. **Probing a Spin Transfer Controlled Nanomagnet with a Single Nitrogen Vacancy in Diamond.** *A. Solyom*[1], Z. Flansberry[1], M. Tschudin[1], N. Leitao[1], M. Pioro-Ladrière[2,3], J. Sankey[1] and L.I. Childress[1] *1. Department of Physics, McGill University, Montreal, QC, Canada; 2. Institut Quantique et Département de Physique, Université de Sherbrooke, Sherbrooke, QC, Canada; 3. Quantum Information Science Program, Canadian Institute for Advanced Research, Toronto, ON, Canada*

AM-07. **Electronic analogs of optical phenomena for spintronic information processing.** A. Sharma[1], A. Tulapurkar[1] and *B. Muralidharan*[1] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

AM-08. **Spin-orbit currents, spin-transfer torque and anomalous tunneling in III-V heterostructures probed by advanced 30 bands and 40-bands k.p tunneling methods.** *D. To*[1], T. Nguyen[1], V. Safarov[1], H. Drouhin[1] and H. Jaffres[2] *1. Laboratoire des Solides Irradiés, Ecole Polytechnique, Palaiseau, France; 2. UMPhy CNRS-Thales, CNRS, Palaiseau, France*

AM-09. **Electrical spin injection into an AlGaAs/GaAs-based 2DEG system with a Co_2MnSi spin source up to room temperature.** Z. Lin[1], D. Pan[1], M. Rasly[1] and *T. Uemura*[1] *1. Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan*

AM-10. **EuS/Co layers as spin-injection source.** *A. Goschew*[1], R.C. Roca[2], N. Nishizawa[2], H. Munekata[2], A. Delimitis[3] and P. Fumagalli[1] *1. Department of Experimental Phyics, Free University Berlin, Berlin, Germany; 2. Imaging Science and Engineering Laboratory, Tokyo Institute of Technology, Yokohama, Japan; 3. Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, Stavanger, Norway*

AM-11. **Effects of current on domain wall motion in $SrRuO_3$.** *M. Yamanouchi*[1,2], T. Oyamada[2], K. Sato[2], H. Ohta[1,2] and J. Ieda[3] *1. Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan; 2. Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

Session AN
MULTIFERROICS AND COMPLEX OXIDES I (Poster Session)

Karsten Kuepper, Chair
Osnabrück University, Osnabrück, Germany

AN-01. **Effects of a High DC Magnetic Field on Spin Reorientation in Dysprosium-Yttrium Iron Garnets at Low Temperatures.** A. Boutaba[1], M. Lahoubi[1] and *W. Wang*[2] *1. Department of Physics, Badji Mokhtar Annaba University, Laboratory L.P.S., Annaba, Algeria; 2. Beijing University of Chemical Technology, Beijing, China*

AN-02. **Anomalous magnetotransport properties of $La_{0.67}Sr_{0.33}MnO_3$/$LaAlO_3$/$SrTiO_3$.** *M. Yamanouchi*[1,2], T. Oyamada[2] and H. Ohta[1,2] *1. Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan; 2. Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan*

AN-03. **Enhancement of ferromagnetic Curie temperature on substitution of Mn in $La_{0.85}Ag_{0.15}CoO_3$ Compound.** *S.K. Srivastava*[1], B. Samantaray[2], T. Bora[3] and S. Ravi[4] *1. Physics, Central Institute of Technology Kokrajhar, Kokrajhar, India; 2. Physics, Indian Institute of Technology Kanpur, Kanpur, India; 3. Physics, National Institute of Technology Meghalaya, Shilong, India; 4. Physics, Indian Institute of Technology Guwahati, Assam, India*

AN-04. **Structure-Property Correlations in (0.5)$Bi_{0.70}A_{0.3}FeO_3$–(0.5) $PbTi_{0.5}Fe_{0.5}O_3$ (A=Sr, Pb, and Ba) System.** *S. Hussain*[1], M. Shariq[1], S. Manzoor[1] and M. Rafique[1] *1. Physics, COMSATS University Islamabad, Islamabad, Pakistan*

AN-05. **Magnetic properties and resistive switching behavior in multiferroic based Ag/BY3FS10O/FTO device for non-volatile memory device application.** *A.K. Jena*[1], A. Chelvane[2] and J. Mohanty[1] *1. Physics, Indian Institute of Technology (IIT) Hyderabad, Sangareddy, India; 2. Advanced Magnetic Group, Defence Metallurgical Research Laboratory (DMRL) Hyderabad, Hyderabad, India*

AN-06. **Ferrimagnetism and Ferroelectricity in κ-Al_2O_3-type $GaFeO_3$ multiferroic thin films.** *S. Yasui*[1], T. Katayama[2] and M. Itoh[1] *1. Tokyo Institute of Technology, Yokohama, Japan; 2. The University of Tokyo, Tokyo, Japan*

AN-07. **Sol-gel Synthesis and Characterization of La-doped $BiFeO_3$ Nanostructured Multiferroic.** *U.L. Shinde*[1], S.M. Kachwala[1], M. Jha[1] and D. Marolikar[1] *1. Physics, KJ Somaiya Institute of Engineering and Information Technology, Mumbai, India*

AN-08. **Phenomenology of Magnetoelectric Switching of Antiferromagnetic Domains.** *A. Parthasarathy*[1] and S. Rakheja[1] *1. Electrical and Computer Engineering, New York University, Brooklyn, NY, United States*

AN-09. **Electrical, Magneto-transport and Magnetization Studies of (1-x)$La_{0.7}Sr_{0.3}Mn_{0.94}Co_{0.06}O_3$(LSMCO)/xZnO (x = 0, 0.04) Composite.** *H.D. Shah*[1] and J.A. Bhalodia[1] *1. Department of Physics, Saurashtra University, Rajkot, India*

AN-10. **Presence of unusual spin reorientation of Fe^{3+}/Mn^{3+} spins in $NdFe_{0.5}Mn_{0.5}O_3$.** *A. Singh*[1], B. Padmanabhan[1], V. Nassif[2,3] and V.K. Malik[1] *1. Physics, Indian Institute of Technology Roorkee, Roorkee, India; 2. Universite Grenoble-Alpes, Grenoble, France; 3. Institute Laue- langevin, Grenoble, France*

TUESDAY MORNING 9:30 — EXHIBIT HALL A

Session AO
MOTORS: MODELING AND SIMULATIONS I (Poster Session)

Paola Tiberto, Chair
INRIM, Torino, Italy

AO-01. **Multi-objective Optimization of the Soft Magnetic Composite Machine with the In-Wheel Applications.** X. Liu[1] and *W. Fu*[1] *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

AO-02. **Design and Analysis of a New Hybrid-Excited Permanent Magnet Machine with Unequal Teeth.** *G. Qu*[1], Y. Fan[1] and Z. Wu[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

AO-03. **Improved Magnetic Equivalent Circuit for Predicting Open-Circuit Field in Interior Permanent Magnet Machines.** *Z. Li*[1], X. Huang[1], L. Wu[1] and Y. Fang[1] *1. Zhejiang University, Hangzhou, China*

AO-04. **Multi-Objective Optimal Design of High Speed Surface Mounted Permanent Magnet Synchronous Motor for Magnetic Levitated Flywheel Energy Storage System.** *Y. Li*[1] and C. Zhu[1] *1. Zhejiang University, Hangzhou, China*

AO-05. **Demagnetization Analysis in Multilayer Magnets of PMa-SynRM Considering Temperature Effect.** *T. Huynh*[1] and M. Hsieh[1] *1. Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan*

AO-06. **Optimization Design of Segmented Permanent-Magnet Shape by Analysis of Thermal Characteristics.** *J. Lee*[1], B. Kim[1], D. Lee[1], W. Lee[1], J. Moon[1] and D. Kang[1] *1. Keimyung University, Daegu, The Republic of Korea*

AO-07. **Effect of Angle Displacement on the Electromagnetic Performance of Dual Three-Phase Consequent-Pole Permanent Magnet Machines.** *F. Li*[1] and K. Wang[1] *1. Electric Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing City, China*

AO-08. **Investigation of the Dynamic Characteristics for a Coaxial Magnetic Gear under Loading Condition.** Y. Zhao[1], *X. Liu*[1], Y. Chen[2], Z. Tian[2], X. Zhang[2], M. Li[1] and S. Huang[1] *1. Hunan University, Changsha, China; 2. China North Vehicle Research Institute, Beijing, China*

AO-09. **A Study on Design of Line Start Synchronous Reluctance Motor Using Metal 3D Printing Technology.** *J. Lee*[1], D. Jung[1], J. Lim[1] and J. Kim[1] *1. Hanyang University, Seoul, The Republic of Korea*

AO-10. **Thermal Analysis of Modular-Spoke-Type Permanent-Magnet Machine Based on Thermal Network and Coupled FEA Method.** J. Qi[1], M. Chen[2] and *W. Hua*[1] *1. Southeast University, Nanjing, China; 2. State Grid Shanghai Municipal Electric Power Company, Shanghai, China*

TUESDAY
MORNING
9:30

EXHIBIT HALL A

Session AP
ROCK MAGNETISM, MAGNETIC FLUIDS AND IMAGING (Poster Session)

Beck Strauss, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

AP-01. **FORC study of the ferromagnetic impurities in Na and K feldspars of "El Realejo" mine.** J.A. Montiel-Anaya[1] and *V. Franco*[1] *1. Universidad de Sevilla, Sevilla, Spain*

AP-02. **Optical and Electrical Property of Carbonized Coal Tar Pitch under a High Magnetic Field of 10 T.** *A. Hamasaki*[1], K. Fujio[1], Y. Takeuchi[2] and S. Ozeki[1] *1. Shinshu University, Matsumoto, Japan; 2. Muroran Institute of Technology, Muroran, Japan*

AP-03. **Effect of Mesocarbon Microbeads on Magnetorheological Fluid Behavior.** *R. Pierce*[1], Y. Choi[1] and N. Wereley[1] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States*

AP-04. **Three-Axis Vibration Isolation of A Full-Scale Magnetorheological Fluid-Based Seat Suspension.** *Y. Choi*[1], N. Wereley[1] and G.J. Hiemenz[2] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States; 2. InnoVital Systems Inc., Beltsville, MD, United States*

AP-05. **Enhanced Magnetorheological Characteristics of Zn-doped Ferrite Nanoparticle-Added Carbonyl Iron-based Suspension.** J. Han[1] and *H. Choi*[1] *1. Department of Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea*

AP-06. **Magneto-viscosity of oil-based Ba-Sr ferrite ferrofluid.** *N. Gautam*[1] and R. Singh[1] *1. School of Physics, University of Hyderabad, Hyderabad, India*

AP-07. **Method for Accelerated Testing of Sedimentation Physics in a Magnetorheological Fluid Column.** *S.G. Sherman*[1], M. Wen[2] and N. Wereley[1] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States; 2. College of Optoelectronic Engineering, Chongqing University, Chongqing, China*

AP-08. **Viscosity Control of Magnetorheological Fluid by Power Saving Magnetizing Mechanism using Permanent Magnet Movement.** *Y. Sato*[1], Y. Nakamura[1] and M. Suzuki[1] *1. Department of Mechanical Engineering, Yokohama National University, Yokohama, Japan*

AP-09. **Effect of particle structure and hydrodynamic size of blood-pooling magnetic nanoparticles on harmonic signal intensity in magnetic particle imaging.** *Y. Ichikawa*[1], S. Ota[2] and Y. Takemura[1] *1. Yokohama National University, Yokohama-shi, Japan; 2. Shizuoka University, Shizuoka-shi, Japan*

AP-10. **Tracking Cells with Iron Nanowires as MRI T2 Contrast Agents.** *A.I. Martínez Banderas*[1], P. Ramos Cabrer[2,4], A. Aires[3], S. Plaza García[2], J. Merzaban[1], T. Ravasi[1], A. López Cortajarena[3,4] and J. Kosel[5] *1. Division of Biological and Environmental Sciences and Engineering, King Abduhllah University of Science and Technology, Thuwal Jeddah, Saudi Arabia; 2. Magnetic Resonance Imaging Department, Molecular Imaging Unit, CIC BiomaGUNE, Donostia-San Sebastián, Spain; 3. CIC BiomaGUNE, Donostia-San Sebastián, Spain; 4. Ikerbasque, Basque Foundation for Science, Bilbao, Spain; 5. Division of Computer, Electrical and Mathematical Sciences and Engineering, King Abduhllah University of Science and Technology, Thuwal Jeddah, Saudi Arabia*

TUESDAY MORNING 9:30 — EXHIBIT HALL A

Session AQ
HIGH FREQUENCY AND MAGNETOELASTIC EFFECTS FOR SENSOR DESIGN I (Poster Session)

Christian Huber, Chair
University of Vienna, Vienna, Austria

AQ-01. **Magnetostrictive Tactile Sensor Array for Object Recognition.** B. Zhang[1], *B. Wang*[1], Y. Li[1] and W. Huang[1] *1. Hebei University of Technology, Tianjin, China*

AQ-02. **Bio-inspired Magnetostrictive Tactile Sensor for Surface Material Recognition.** W. Zheng[1,2], *B. Wang*[1,2], H. Liu[3] and X. Wang[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment (School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province (School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 3. State Key Laboratory of Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University, Beijing, China*

AQ-03. **Optimal Design and Analysis of the Field Excitation Coil in RFECT System for Ferromagnetic Pipeline Inspection.** *H. Kim*[1], H. Yoo[2] and G. Park[1] *1. Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea; 2. Korea Gas Corporation, Incheon, The Republic of Korea*

AQ-04. **Synthesis and characterization of nitrogen-doped graphene/ $MnFe_2O_4$@SiO_2 sphere hybrids with high-performance microwave absorption.** *Y. Xiong*[1], H. Luo[1], X. Wang[1] and R. Gong[1] *1. Huazhong University of Science & Technology, Wuhan, China*

AQ-05. **Highly sensitive magnetic field sensing using magnetization dynamics in yttrium iron garnet single crystal thin films.** *T. Koda*[1], S. Muroga[2] and Y. Endo[3] *1. National Institute of Technology, Oshima College, Suo-Oshima, Japan; 2. Akita University, Akita, Japan; 3. Tohoku University, Sendai, Japan*

AQ-06. **Optimal Frequency of Low-frequency Eddy Current Testing for Detecting Cracks on the Posterior Side of Steel Plates.** W. Yoshimura[1], *T. Sasayama*[1] and K. Enpuku[1] *1. Kyushu University, Fukuoka, Japan*

AQ-07. **Sprayed Magnetostrictive Powder Coating Transducer for On-line Monitoring of Multi-wire Cables using Guided Waves.** *P. Zhang*[1], Z. Tang[2], Q. Qi[3], J. Wu[1], F. Lv[1], X. Gao[3] and K. Yang[1] *1. Zhejiang University, State Key Laboratory of Fluid Power and Mechatronic Systems, Hangzhou, China; 2. Zhejiang University, Institute of Advanced Digital Technologies and Instrumentation, Hangzhou, China; 3. University of Science and Technology, State Key Laboratory for Advanced Metals and Materials, Beijing, China*

AQ-08. **Optimization of Low-Noise and Low-Power Miniature Fluxgate Magnetometer.** *N. Sun*[1], A. Matyushov[1] and N. Sun[1] *1. ECE, Northeastern University, Boston, MA, United States*

AQ-09. **Performance analysis of the inverse-magnetostrictive tactile sensor and object feature extraction.** *L. Wan*[1,2] and B. Wang[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

Session AR
MULTI-LAYERED FILMS AND SUPERLATTICES I (Poster Session)

Sergiu Ruta, Chair
University of York, York, United Kingdom

AR-01. **Interfacial Coupling-Induced Noncollinear Magnetism in $La_{0.5}Sr_{0.5}CoO_{3-\delta}/La_{2/3}Sr_{1/3}MnO_3/ La_{0.5}Sr_{0.5}CoO_{3-\delta}$ Heterostructures.** *J. Zhang*[1,2], J. Zhang[1,2], B. Shen[1,2] and J. Sun[1,2] *1. State Key Laboratory of Magnetism & Institute of Physics, Chinese Academy of Sciences, Peking, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

AR-02. **Antiferromagnetic Interlayer Coupling of (111)-Oriented $La_{0.67}Sr_{0.33}MnO_3/SrRuO_3$ Superlattice.** *H. Zhang*[1,2], J. Zhang[1,2], J. Zhang[1,2], F. Han[1,2], H. Huang[1,2], J. Song[1,2], B. Shen[1,2] and J. Sun[1,2] *1. Beijing National Laboratory for Condensed Matter & Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

AR-03. **Tuning perpendicular magnetic anisotropy in Co\Pt multilayers: crystalline texture vs. interface quality.** *O. Yildirim*[1,2], M.A. Marioni[1], C. Falub[2], D. Jaeger[2], H. Rohrmann[2] and H.J. Hug[1] *1. Nanoscale Materials Science, Empa-Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; 2. Evatec AG, Trübbach, Switzerland*

AR-04. **Structural optimization and study of magnetism of $L1_0$-FeCo.** *H. Ito*[1], M. Saito[1], T. Miyamachi[2], F. Komori[2], T. Koganezawa[3], M. Mizuguchi[4] and M. Kotsugi[1] *1. Tokyo University of Science, Katsushika, Japan; 2. ISSP of The University of Tokyo, Kashiwa, Japan; 3. JASRI/SPring-8, Sayo, Japan; 4. IMR of Tohoku University, Sendai, Japan*

AR-05. **Electrical Transport in $La_{0.7}Ca_{0.3}MnO_3/Pr_{0.58}Ca_{0.42}MnO_3$ Superlattices: Effect of Substrate Twinning.** *S. Chauhan*[1], P. Siwach[1], K. Maurya[1] and H. Singh[1] *1. Physics, CSIR-National Physical Laboratory, New Delhi, India*

AR-06. **Influence of Co Layer Thickness on the Magnetic Properties of Co/Si Multilayer.** *R. Roy*[1], D. Singh[1] and M.S. Kumar[1] *1. Department of Physics, Indian Institute of Technology Bombay, Mumbai, India*

AR-07. **Effect of interfaces on magnetic properties of Cu-Zn ferrite/ZnO multilayers.** *J. Kaur*[1] and R. Singh[1] *1. School of Physics, University of Hyderabad, Hyderabad, India*

AR-08. **Transport properties in $YBa_{1.85}Eu_{0.15}Cu_3O_{7-\delta}/La_{0.67}Ca_{0.33}MnO_3$ superlattices grown on (001) $SrTiO_3$ substrate.** S. Huang[1,2], B. Qian[4], Z. Zhang[1], W. Xie[1], A. Zhang[3], F. Zhang[1] and *X. Wu*[1] *1. State Key Lab of Solid State Microstructures, School of Physics, Nanjing University, Nanjing 210093, China; 2. School of Physics and technology, Nanjing Normal University, Nanjing 210094, China; 3. College of Science, Hohai University, Nanjing 210098, China; 4. School of Physics & Electronic Engineering, Changshu Institute of Technology, Changshu, 215500, China*

AR-09. **Perpendicular magnetic anisotropy of Fe_3O_4/Cr multilayers.** *D. Oshima*[1], T. Kato[2] and S. Iwata[1] *1. Institute of Materials and Systems for Sustainability, Nagoya university, Nagoya, Japan; 2. Department of Electronics, Nagoya university, Nagoya, Japan*

TUESDAY
MORNING
9:30

EXHIBIT HALL A

Session AS
RARE-EARTH INTERMETALLICS AND COMPOUNDS I (Poster Session)

Alexander Baker, Chair
Lawrence Livermore National Laboratory, Livermore, CA, United States

AS-01. **High-performance Nd-Fe-B Sintered Magnets via Co-doping Low-melting-point $Dy_{71.5}Fe_{28.5}$ and High-melting-point Zr.** *J. Jin*[1], G. Bai[1], Z. Zhang[1] and M. Yan[1] *1. School of Materials Science and Engineering, Zhejiang University, Hangzhou, China*

AS-02. **Development of MM-Fe-Co-B Permanent Magnet Alloys via High-throughput Methods.** *R.P. Chaudhary*[2], K. Gandha[2], F. Meng[2,1], D. Paramanik[1], E. Simsek[2], M.J. Kramer[2,1], C.I. Nlebedim[2] and R. Ott[2,1] *1. Division of Materials Science and Engineering, Ames Laboratory, Ames, IA, United States; 2. Critical Materials Institute, Ames Laboratory, Ames, IA, United States*

AS-03. **The Effect of Nd_8Cu_2 Alloy on the Microstructure and Magnetic Properties of (Nd, MM) FeB Sintered Magnets.** Q. Ma[1,2], Z. Hu[2], Z. Zhang[2], Y. Liu[1,2], F. Liu[2], *X. Zhang*[1,2], G. Wang[1] and Y. Li[1,2] *1. Inner Mongolia Key Laboratory for Utilization of Bayan Obo Multi Metallic Resources: Elected State Key Laboratory, Inner Mongolia University of Science and Technology, Baotou, China; 2. School of Science, Inner Mongolia University of Science and Technology, Baotou, China*

AS-04. **Anisotropic Nanostructured $SmCo_5$ Bonded Magnets Prepared by Magnetic Field Assisted Processing.** *H. Li*[1], Q. Wu[1], M. Yue[1], H. Zhang[1], W. Liu[1], Y. Li[1], Z. Shang[1] and J. Zhang[1] *1. Beijing University of Technology, Beijing, China*

AS-05. **Magnetic Properties and Microstructure of $Sm_{0.7}Y_{0.3}Co_5$ Magnet Prepared by Traditional Powder Metallurgy Technique.** *N. Cai*[1], R. Zhu[1], D. Zhang[1], M. Yue[1], W. Liu[1], H. Zhang[1], Q. Wu[1] and Z. Shang[1] *1. College of Materials Science and Engineering, Beijing University of Technology, Beijing, China*

AS-06. **Magnetic performance of (Nd,Ce)-Fe-B-type die-upset hybrid magnet composed of melt-spun and HDDR-treated materials.** *D.R. Djuanda*[1], H. Kwon[1], C. Yang[2], M. Kang[2] and J. Lee[3] *1. Pukyong National University, Busan, The Republic of Korea; 2. Sungkyunkwan University, Suwon, The Republic of Korea; 3. Korea Institute of Materials Science, Changwon, The Republic of Korea*

AS-07. **Effect of milling condition on magnetic properties of $Sm_2Fe_{17}N_3$ powder by modified reduction-diffusion process.** *M. Kang*[1] and J. Kim[1] *1. Department of Materials Science and Chemical Engineering, Hanyang University, Ansan, The Republic of Korea*

AS-08. **Investigation of rare-earth-lean $Nd_{1+x}Fe_{11}Ti_1$ thin films.** *A. Kaidatzis*[1], G. Giannopoulos[1], V. Psycharis[1] and D. Niarchos[1] *1. Institute of Nanoscience and Nanotechnology, NCSR Demokritos, Aghia Paraskevi, Athens, Greece*

TUESDAY
AFTERNOON
1:30

SALON 2

Session BA

MAGNETIC NANOPARTICLES AND NANOGRAINS FOR BIOSENSING AND MAGNETIC RECORDING

Ian Gilbert, Chair

Seagate Technology, Shakopee, MN, United States

1:30

BA-01. **Magnetic biochip platforms: manipulating and detecting magnetic labelled bioanalytes in lab on chip devices.** ***(Invited)*** *P.P. Freitas*[2,1], V. Romao[1,3], S. Martins[1,3], E. Fernandes[2], C. Carvalho[2], S. Cardoso de Freitas[1,4], V. Silverio[1], T. Sobrino[5], J. Castillo[5], A. Chicharo[2,6], L. Dieguez[2] and B. Espina[2] *1. INESC MN, Lisbon, Portugal; 2. International Iberian Nanotechnology Laboratory, Braga, Portugal; 3. Magnomics, Lisbon, Portugal; 4. Physics, IST, Lisbon, Portugal; 5. CHUS, SERGAS, Santiago de Compostela, Spain; 6. Biomedical Eng, IST, Lisbon, Portugal*

2:06

BA-02. **Droplet-based Magnetofluidic Platforms for Detection and Analytics.** ***(Invited)*** *D. Makarov*[1] *1. Helmholtz-Zentrum Dresden-Rossendorf e.V., Dresden, Germany*

2:42

BA-03. **Evaluation of Media Noise Mechanisms in Heated Dot Magnetic Recording.** ***(Invited)*** *S. Hernandez*[1], D. Karns[1], W.R. Eppler[1], P. Jin[1], Z. Liu[1], P. Krivosik[2], K. Wago[3], K. Lee[3], P. Steiner[3], C.J. Rea[2] and T. Rausch[1] *1. Seagate Research, Shakopee, MN, United States; 2. Recording Head Operations, Seagate Technology, Bloomington, MN, United States; 3. Recording Media Operations, Seagate Technology, Fremont, CA, United States*

3:18

BA-04. **Correlating Static and Dynamic Magnetic Properties of FePt Nano-grains with Recording Performance.** ***(Invited)*** *S. Jain*[1], D. Tripathy[1], K. Srinivasan[1], T. Seki[1], H. Yuan[1], H. Ho[1], A. Ajan[1], B. Valcu[1], P. Dorsey[1], D. Griffith[1], C. Papusoi[1] and R. Acharya[1] *1. Western Digital, San Jose, CA, United States*

3:54

BA-05. **Thermally and magnetically non-volitile 3-nm shell-ferromagnetic Heusler bits.** ***(Invited)*** A. Cakir[1] and *M. Acet*[2] *1. Department of Metallurgical and Materials Engineering, Mugla Sitki Kocman University, Mugla, Turkey; 2. Phyiscs, Duisburg-Essen University, Duisburg, Germany*

TUESDAY AFTERNOON 1:30 — SALON 3

Session BB
SPIN CURRENTS & SPIN-ORBIT TORQUES: FROM INTRINSIC TO INTERFACIAL

Felix Casanova, Chair
CIC nanoGUNE, Donostia-San Sebastian, Spain

1:30

BB-01. **Enhanced spin pumping into superconductors provides evidence for superconducting pure spin currents.** ***(Invited)*** K. Jeon[1], *C. Ciccarelli*[2], A. Ferguson[2], H. Kurebayashi[3], L. Cohen[4], X. Montiel[5], M. Eschrig[5], J. Robinson[1] and M.G. Blamire[1] *1. Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; 2. Physics, University of Cambridge, Cambridge, United Kingdom; 3. University College London, London, United Kingdom; 4. Imperial College London, London, United Kingdom; 5. Royal Holloway University, London, United Kingdom*

2:06

BB-02. Exchange-field-enhanced superconducting spin currents. *K. Jeon*[1,2], C. Ciccarelli[2], H. Kurebayashi[3], L. Cohen[4], X. Montiel[5], M. Eschrig[5], S. Komori[1], J. Robinson[1] and M.G. Blamire[1] *1. Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; 2. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 3. London Centre for Nanotechnology and Department of Electronic and Electrical Engineering, University of College London, London, United Kingdom; 4. The Blackett Laboratory, Imperial College London, London, United Kingdom; 5. Department of Physics, Royal Holloway, University of London, London, United Kingdom*

2:18

BB-03. Dynamic Spin Transport in Antiferromagnetic Insulators: Angular Dependent Spin Pumping in $Y_3Fe_5O_{12}$/NiO/Pt Trilayers. *Y. Cheng*[1], R. Zarzuela[2], J. Brangham[1], A.J. Lee[1], S. White[1], P. Hammel[1], Y. Tserkovnyak[2] and F. Yang[1] *1. Physics, The Ohio State University, Columbus, OH, United States; 2. Physics, University of California, Los Angeles, Los Angles, CA, United States*

2:30

BB-04. Following spin currents through multilayered structures. C. Klewe[1], P. Shafer[1], S. Emori[2], Z. Qiu[3] and *E. Arenholz*[1] *1. LBNL, Berkeley, CA, United States; 2. Department of Physics, Virginia Tech, Blacksburg, VA, United States; 3. UC Berkeley, Berkeley, CA, United States*

2:42

BB-05. Planar Hall torque in ferromagnetic/nonmagnetic multilayers. *E.A. Montoya*[1], C.J. Safranski[1] and I. Krivorotov[1] *1. Department of Physics & Astronomy, University of California, Irvine, Irvine, CA, United States*

2:54

BB-06. An Intrinsic Spin Orbit Torque Nano-Oscillator. *M. Haidar*[1,2], A.A. Awad[2], M. Dvornik[2], R. Khymyn[2], A. Houshang[2] and J. Åkerman[2] *1. Chalmers University of Technology, Gothenburg, Sweden; 2. University of Gothenburg, Gothenburg, Sweden*

3:06

BB-07. Intrinsic Spin Hall Effect in Ferromagnets. *V. Amin*[1,2], X. Fan[3], M. Stiles[1] and P.M. Haney[1] *1. NIST, Gaithersburg, MD, United States; 2. University of Maryland, College Park, MD, United States; 3. Department of Physics and Astronomy, University of Denver, Denver, CO, United States*

3:18

BB-08. Single-layer spin-orbit torques in a fully-compensated, half-metallic Ferrimagnet. S. Lenne[1], Y. Lau[2] and *K. Rode*[1] *1. CRANN, AMBER and School of Physics, Trinity College Dublin, Dublin, Ireland; 2. Department of Physics, The University of Tokyo, Tokyo, Japan*

3:30

BB-09. **Engineering Spin-Orbit Torques by Interfacial Oxidation.** *J. Nath*[1,2], A. Trifu[1,2], S. Auffret[1,2], I. Joumard[1,2], G. Gaudin[1,2] and I. Miron[1,2] *1. SPINTEC (CEA/CNRS), Grenoble, France; 2. Université Grenoble Alpes, Grenoble, France*

3:42

BB-10. **Spin Hall magnetoresistance effect in $CoFe_2O_4$/Pt/$CoFe_2O_4$ sandwich films.** T. Yamamoto[1], T. Yanase[2], T. Shimada[2] and *T. Nagahama*[2] *1. CSE, Hokkaido Univ., Sapporo, Japan; 2. Graduate School of Engineering, Hokkaido Univ., Sapporo, Japan*

3:54

BB-11. **Spin Hall magnetoresistance in ferrimagnetic Pt/$Co_{1-x}Tb_x$ bilayers.** Y. Xu[1], D. Chen[1], J. Zhao[1] and *D. Wei*[1] *1. State Key Laboratory for Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China*

4:06

BB-12. **Spin-orbit torques in heavy metal/ferromagnet bilayers with varying strength of interfacial spin-orbit coupling.** *L. Zhu*[1], D. Ralph[1] and R. Buhrman[1] *1. Cornell University, Ithaca, NY, United States*

4:18

BB-13. **Non-local transport, spin- and ordinary-Hall effects in ultrathin Au-based multilayers.** *M. El Hadri*[1], Y. Xiao[1] and E. Fullerton[1] *1. Center for Memory and Recording Research, University of California, San Diego, La Jolla, CA, United States*

TUESDAY
AFTERNOON
1:30

SALON 1

Session BC
SKYRMIONS I
Ran Cheng, Chair
University of California, Riverside, Riverside, CA, United States

1:30

BC-01. **Controlling the Profile, Stability and Dynamics of Chiral Hybrid Skyrmions.** *W. Legrand*[1*], N. Ronceray[1,2], N. Reyren[1], D. Maccariello[1], V. Cros[1] and A. Fert[1] *1. Unité Mixte de Physique CNRS/Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; 2. Ecole Polytechnique, Palaiseau, France*

1:42

BC-02. **Room temperature magnetic imaging of chiral domain walls in synthetic anti-ferromagnets multilayers.** *F. Ajejas*[1], W. Legrand[1], M. Akthar[2], S. Chouaieb[2], A. Haykal[2], D. Maccariello[1], N. Reyren[1], S. Collin[1], K. Bouzehouane[1], A. Vecchiola[1], V. Cros[1], V. Jacques[2] and A. Fert[1] *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 2. Laboratoire Charles Coulomb, Université de Montpellier and CNRS, Montpellier, France*

1:54

BC-03. **Tunable Chiral Spin Textures Characterized by Resonant Soft X-ray Diffraction.** *P. Shafer*[1], G. Chen[2,3], A.T. N'Diaye[1], X. Xiao[4], J. Hong[5], L. Sun[4], J. Liang[4], S. Sloetjes[6,1], C. Ophus[2], A. Young[1], H. Ding[7], A. Scholl[1], Z. Qiu[8], Y. Wu[4], K. Liu[3], A.K. Schmid[2] and E. Arenholz[1] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. Department of Physics, University of California, Davis, CA, United States; 4. Department of Physics, Fudan University, Shanghai, China; 5. Electrical Engineering and Computer Sciences, University of California, Berkeley, CA, United States; 6. Electronics and Telecommunications, NTNU, Trondheim, Norway; 7. Department of Physics, Nanjing University, Nanjing, China; 8. Department of Physics, University of California, Berkeley, CA, United States*

2:06

BC-04. **Direct imaging of hybrid chiral domain walls in multilayer thin film systems with interfacial exchange interaction using Lorentz microscopy.** K. Fallon[1], *S. McVitie*[1], W. Legrand[2], D. Maccariello[2], S. Collin[2], K. Garcia[2], N. Reyren[2], V. Cros[2] and A. Fert[2] *1. Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 2. Unité Mixte de Physique, CNRS, Paris, France*

2:18

BC-05. **Current- and field-driven dynamics of chiral domain walls in a magnetic insulator.** *C. Avci*[1,2], E.R. Rosenberg[1], L.M. Caretta[1], M. Mann[1], L. Beran[3,1], C. Ross[1] and G. Beach[1] *1. Materials Science and Eng., Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Materials, ETH Zürich, Zürich, Switzerland; 3. Charles University, Prague, Czechia*

2:30

BC-06. **Imaging the reversal of domain wall chirality in Pt/CoB/Ir by *in-situ* scanning electron microscopy with polarization analysis.** *M.J. Meijer*[1], J. Lucassen[1], R. Duine[1,2], H. Swagten[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Department of Applied Physics / Physics of Nanostructures, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Institute of Theoretical Physics, Utrecht University, Utrecht, Netherlands*

2:42

BC-07. **Investigation of Néel-type Magnetic Skyrmions using Off-axis Electron Holography.** *T. Denneulin*[1], J. Caron[1], A. Kovacs[1], M. Hoffmann[2], B. Zimmermann[2], S. Blügel[2], M. Raju[3], C. Panagopoulos[3] and R.E. Dunin-Borkowski[1] *1. Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich, Jülich, Germany; 2. Peter Grünberg Institute and Institute for Advanced Simulation, Forschungszentrum Jülich, Jülich, Germany; 3. Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

2:54

BC-08. **Sub-monolayer capping induced switching of magnetic chirality.** *G. Chen*[1], R. Lo Conte[2,3], A.K. Schmid[4] and K. Liu[1,5] *1. Physics Department, University of California, Davis, Davis, CA, United States; 2. Institute of Applied Physics, University of Hamburg, Hamburg, Germany; 3. Materials Science and Engineering Department, University of California, Berkeley, Berkeley, CA, United States; 4. Materials Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. Physics Department, Georgetown University, Washington, DC, United States*

3:06

BC-09. **Lifetime and Dynamics of (Anti)Skyrmions.** *O. Tretiakov*[1], M. Potkina[2,4], I. Lobanov[3], V. Uzdin[3,2] and H. Jonsson[4] *1. IMR, Tohoku University, Sendai, Japan; 2. St. Petersburg State University, St. Peterburg, Russian Federation; 3. ITMO, St. Peterburg, Russian Federation; 4. University of Iceland, Reykjavk, Iceland*

3:18

BC-10. **Boundary twists, instabilities, and (anti)skyrmion creation.** *A. Kovalev*[1] *1. University of Nebraska - Lincoln, Lincoln, NE, United States*

3:30

BC-11. **Computational study of tetragonal Inverse-Heusler compounds for anti-skyrmions.** *J. Ma*[1], Y. Xie[1], J. He[2], H. Vakilitaleghani[1], C. Wolverton[2] and A. Ghosh[1] *1. Electrical and Computer Engineering, University of Virginia, Charlottesville, VA, United States; 2. Department of Materials Science and Engineering, Northwestern University, Evanston, IL, United States*

3:42

BC-12. **Statistical thermodynamic approach for the computation of the entropy of a magnetic skyrmion.** R. Zivieri[1], *R. Tomasello*[2], M. Carpentieri[3], O. Chubykalo-Fesenko[4] and G. Finocchio[2] *1. Univestiy of Ferrara, Ferrara, Italy; 2. University of Messina, Messina, Italy; 3. Politecnico di Bari, Bari, Italy; 4. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain*

3:54

BC-13. **Skyrmion formation in $SrRuO_3$-$SrIrO_3$ epitaxial bilayer.** *H.J. Hug*[1,2], A. Mandru[1], M. Bacani[1], A.S. Ahmed[3], K. Meng[3] and F. Yang[3] *1. Nanoscale Materials Science, Empa, Duebendorf, Switzerland; 2. Physics, University of Basel, Basel, Switzerland; 3. Physics, The Ohio State University, Columbus, OH, United States*

4:06

BC-14. **Precipitating Ordered Skyrmion Lattices from Helical Spaghetti.** *D. Gilbert*[1,2], A.J. Grutter[2], P. Neves[3], G. Shu[4], G. Zimanyi[5], B.B. Maranville[2], F. Chou[4], K.L. Krycka[2], N. Butch[2,3], S. Huang[6] and J. Borchers[2] *1. Materials Science, University of Tennessee, Knoxville, TN, United States; 2. National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Physics, University of Maryland, College Park, MD, United States; 4. Materials and Minerals Engineering, National Taipei University of Technology, Taipei, Taiwan; 5. Physics, University of California, Davis, CA, United States; 6. Physics, University of Miami, Miami, FL, United States*

TUESDAY AFTERNOON 1:30 — MARYLAND

Session BD
DOMAIN WALL AND RELATED DEVICES
Vincent Sokalski, Chair
Carnegie Mellon University, Pittsburgh, PA, United States

1:30

BD-01. **Domain Wall Type Spin Memristor for Analogue Neuromorphic Computing.** *T. Shibata*[1], T. Shinohara[1], T. Ashida[1], M. Ohta[1], K. Ito[1], S. Yamada[1], Y. Terasaki[1] and T. Sasaki[1] *1. Technology & Intellectual Property HQ, TDK Corporation, Ichikawa, Japan*

1:42

BD-02. **Deterministic multi-Hall resistance changes for a neuromorphic memristor application due to a DW motion in a single Hall bar.** *Y. Kim*[1], J. Kwon[1], H. Hwang[1] and C. You[1] *1. Department of Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea*

1:54

BD-03. **Frequency-Division Multiplexing in Magnonic Logic Networks Based on Caustic-Like Spin Wave Beams.** F. Heussner[1], G. Talmelli[2], M. Nabinger[1], T. Fischer[1], T. Brächer[1], A.A. Serga[1], F. Ciubotaru[2], C. Adelmann[2], B. Hillebrands[1] and *P. Pirro*[1] *1. Physics, Technische Universität Kaiserslautern, Kaiserslautern, Germany; 2. IMEC, Leuven, Belgium*

2:06

BD-04. **Electrically Controllable Magnetic Switching and Soliton Motion in Insulating Magnetic Garnets with Perpendicular Magnetic Anisotropy.** *A. Ross*[1,2], S. Ding[3,2], S. Becker[1], Y. Kurokawa[4], S. Gupta[1], J. Yang[3], R. Lebrun[1], G. Jakob[1,2] and M. Kläui[1,2] *1. Johannes-Gutenberg University Mainz, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 3. State Key Laboratory for Mesoscopic Physics, Peking University, Beijing, China; 4. Graduate School of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan*

2:18

BD-05. **Control of domain wall motion with tilted magnetization for domain wall devices.** *T. Jin*[1], F. Tan[1], C.C. Ang[1], W. Gan[1], J. Cao[2], W. Lew[1] and S. Piramanayagam[1] *1. Nanyang Technological University, Singapore, Singapore; 2. Lanzhou University, Gansu, China*

2:30

BD-06. **Excitation and Amplification of Spin Waves by Spin-Orbit Torque.** *S. Urazhdin*[1], B. Divinskiy[2], V.E. Demidov[2], R. Freeman[1], A. Rinkevich[3] and S.O. Demokritov[2,3] *1. Physics, Emory University, Atlanta, GA, United States; 2. Institute for Applied Physics and Center for Nonlinear Science, University of Muenster, Muenster, Germany; 3. Physics, Institute of Metal Physics UB RAS, Ekaterinburg, Russian Federation*

2:42

BD-07. **Mutual synchronization of higher-order propagating spin-wave modes in MTJ based spin-torque nano-oscillators.** *H. Fulara*[1], R. Khymyn[1], A. Houshang[1], A. Gangwar[1], R. Ferreira[2], P. Freitas[2], M. Dvornik[1] and J. Åkerman[1,3] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Department of Nanoelectronics, INL-International Iberian Nanotechnology Laboratory, Braga, Portugal; 3. Department of Applied Physics, KTH Royal Institute of Technology, Kista, Sweden*

2:54

BD-08. **Manipulation of Spin Wave Interference Using Thermal Gradients.** *G.A. Riley*[1], K.E. Nygren[1], C.L. Ordóñez-Romero[2] and K. Buchanan[1] *1. Physics, Colorado State University, Fort Collins, CO, United States; 2. Instituto de Física, , Universidad Nacional Autónoma de México, Mexico City, Mexico*

3:06

BD-09. **Mutual control of coherent spin waves and magnetic domain walls in a magnonic device.** *J. Han*[1], P. Zhang[1], J.T. Hou[1] and L. Liu[1] *1. Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States*

3:18

BD-10. **Control of single domain wall dynamics in an amorphous microwire.** E. Calle[1], M. Vázquez[1] and *R. Perez del Real*[1] *1. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain*

3:30

BD-11. **Programmable Control of Spin-Wave Transmission in a Domain-Wall Spin Valve.** S.J. Hämäläinen[1], M. Madami[2], H. Qin[1], G. Gubbiotti[3] and *S. van Dijken*[1] *1. Department of Applied Physics, Aalto University, Espoo, Finland; 2. Dipartimento di Fisica e Geologia, Università di Perugia, Perugia, Italy; 3. Istituto Officina dei Materiali del CNR (CNR-IOM), Perugia, Italy*

3:42

BD-12. **Phase Diagram of 360-degree Domain Walls in Magnetic Rings.** *J.E. Bickel*[1] and K.E. Aidala[2] *1. Physics, Cleveland State University, Cleveland, OH, United States; 2. Physics, Mount Holyoke College, South Hadley, MA, United States*

3:54

BD-13. **A Spin Wave Correlator Using Parametric Interactions.** *M. Hansen*[1], I. Lisenkov[2,1], N. Nujhat[1], L. Huaping[1], A. Jander[1] and P. Dhagat[1] *1. Electrical Engineering and Computer Science, Oregon State University, Corvallis, OR, United States; 2. Electrical and Computer Engineering, Northeastern University, Boston, MA, United States*

4:06

BD-14. **Spin-wave phase shifter upon a single linear defect.** *O. Dobrovolskiy*[1,2], R. Sachser[1], S. Bunyaev[3], D. Navas[3], V. Bevz[2,4], M. Zelent[5], J. Rychly[5], M. Krawczyk[5], R. Vovk[2,4], M. Huth[1] and G.N. Kakazei[3] *1. Physikalisches Institut, Goethe University, Frankfurt, Germany; 2. Physics Department, V. Karazin National University, Kharkiv, Ukraine; 3. IFIMUP-IN/ Department of Physics and Astronomy, University of Porto, Porto, Portugal; 4. Ukrainian State University of Railway Transport, Kharkiv, Ukraine; 5. Nanomaterials Physics Division, Adam Mickiewicz University in Poznan, Poznan, Poland*

4:18

BD-15. **Spin-wave Confinement and Coupling in Organic-Based Magnetic Nanostructures.** *M. Chilcote*[1], M. Harberts[1], Y. Lu[2], H. Yu[1], B. Fuhrmann[3], K. Lehmann[4], A. Franson[1], N. Zhu[5], H. Tang[5], G. Schmidt[3,4] and E. Johnston-Halperin[1] *1. Physics, The Ohio State University, Columbus, OH, United States; 2. Chemistry, The Ohio State University, Columbus, OH, United States; 3. IZM, Martin-Luther-Universitat Halle-Wittenberg, Halle, Germany; 4. Institute fur Physik, Martin-Luther-Universitat Halle-Wittenberg, Halle, Germany; 5. Electrical Engineering, Yale University, New Haven, CT, United States*

Session BE
MAGNETIC SEMICONDUCTORS AND MAGNETISM IN HEUSLER COMPOUNDS

Ryan Need, Chair
NIST Center for Neutron Research, Gaithersburg, MD, United States

1:30

BE-01. **Ferromagnetic behavior in rare earth-doped III-nitride semiconductors grown by Molecular beam epitaxy.** *R. Palai*[1], K. Dasari[1], W. Jadwisienczak[2] and H. Huhtinen[3] *1. Department of Physics, University of Puerto Rico, San Juan, PR, United States; 2. School of Electrical Engineering and Computer Science, Ohio University, Athens, OH, United States; 3. Department of Physics, University of Turku, Turku, Finland*

1:42

BE-02. **Giant molecular modulation of the magnetization direction in a magnetic semiconductor.** *X. Wang*[1], H. Wang[1], J. Ma[1] and J. Zhao[1] *1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China*

1:54

BE-03. **Role of rare-earth size on the structural, electronic and magnetic properties of doubly ordered R_2NiMnO_6 perovskites.** *M. Nasir*[1], M.U. Khan[2] and S. Sen[1] *1. Department of Physics, Indian Institute of Technology Indore, INDORE, India; 2. Department of Physics, Miami University, Miami, OH, United States*

2:06

BE-04. **High Curie Temperature and Electrical Control of Magnetic Properties in Fe-based Narrow-gap III-V Ferromagnetic Semiconductor Heterostructures.** ***(Invited)*** *L. Anh*[1,2], N. Thanh Tu[1], N. Pham[3,4] and M. Tanaka[1,4] *1. Department of Electrical Engineering and Information Systems, The University of Tokyo, Bunkyo, Japan; 2. Institute of Engineering Innovation, The University of Tokyo, Bunkyo, Japan; 3. Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Meguro, Japan; 4. Center for Spintronics Research Network (CSRN), The University of Tokyo, Bunkyo, Japan*

2:42

BE-05. **Room-Temperature Dilute Magnetic Semiconductor in V-doped Monolayer WSe_2.** *D. Duong*[1], S. Yun[1] and Y. Lee[1,2] *1. Center for Integrated Nanostructure Physics (CINAP), Institute for Basic Science (IBS), Suwon 16419, The Republic of Korea; 2. Department of Energy Science, Sungkyunkwan University, Suwon 16419, The Republic of Korea*

2:54

BE-06. **Interlayer Exchange Coupling in Ferromagnetic Semiconductor Trilayers with Out-of-Plane Magnetic Anisotropy.** *P. Chongthanaphisut*[1], S. Bac[1,2], S. Choi[1], J. Chang[1], S. Choi[1], S. Lee[1], M. Nnaji[2], X. Liu[2], M. Dobrowolska[2] and J. Furdyna[2] *1. Physics, Korea University, Seoul, The Republic of Korea; 2. Physics, University of Notre Dame, Notre Dame, IN, United States*

3:06

BE-07. **Room-Temperature Skyrmions in MnNiX Compounds.** *W. Zhang*[1,2], B. Balasubramanian[1,2], X. Li[1], S. Valloppilly[1], L. Yue[1], R. Skomski[1,2] and D.J. Sellmyer[1,2] *1. Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, United States; 2. Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, United States*

3:18

BE-08. **Anomalous Hall effects in five-elements Heusler alloy, Co_2(Fe-Mn)(Al-Si) films.** *T. Kubota*[1,2], Z. Wen[1,2] and K. Takanashi[1,2] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

3:30

BE-09. **High-field Magnetotransport Study of the Anisotropy of a Highly Spin-polarised Low-moment Ferrimagnet - $Mn_2Ru_{0.9}Ga$.** *A. Jha*[1], S. Lenne[1], G. Atcheson[1], K. Rode[1] and P.S. Stamenov[1] *1. School of Physics and CRANN, Trinity College, Dublin, Ireland*

3:42

BE-10. **Colossal Second Order Magnetocaloric Effect at Room and High Temperature in $MnFe_2Ga$ Heusler Alloy for Magnetic Refrigeration.** *E. Martinez-Teran*[1], A. Cordeiro[1] and A.A. El-Gendy[1] *1. Physics, University of Texas-El Paso, El Paso, TX, United States*

3:54

BE-11. **Phase stabilization of epitaxial cubic Mn_2Ru_xAl Heusler alloy thin films.** *H. Kurt*[1], K. Siewierska[2], G. Atcheson[2], M. Venkatesan[2], K. Rode[2], P.S. Stamenov[2] and M. Coey[2] *1. Engineering Physics, Istanbul Medeniyet University, Istanbul, Turkey; 2. School of Physics and CRANN, Trinity College Dublin, Dublin, Ireland*

4:06

BE-12. **Magnetism of the compensated ferrimagnetic half-metal $Mn_{1.5}V_{0.5}FeAl$ Heusler.** *R. Zhang*[1], M. Venkatesan[1], P.S. Stamenov[1], Z. Gercsi[1] and M. Coey[1] *1. Department of Physics, Trinity College Dublin, Dublin, Ireland*

4:18

BE-13. **Effects of thermal spin disorder on the half-metallicity of Co_2MnSi with antisite defects and Fe substitution.** *G.G. Baez Flores*[1] and K. Belashchenko[1] *1. Physics, University Of Nebraska Lincoln, Lincoln, NE, United States*

Session BF
CRITICAL PHENOMENA, QUANTUM SPIN LIQUIDS, f-ELECTRON MAGNETISM AND MOLECULAR MAGNETS

Rebecca Dally, Chair
University of California, Santa Barbara, Goleta, CA, United States

1:30

BF-01. **Quantum Spin Liquid in 5d-Electron Honeycomb Compound $H_3LiIr_2O_6$. *(Invited)*** *K. Kitagawa*[1] *1. Department of Physics, The University of Tokyo, Tokyo, Japan*

2:06

BF-02. **Lattice symmetry breaking effects on the Raman phonon spectra of Kitaev magnet α-$RuCl_3$.** *T. Mai*[1], A. McCreary[5], P. Lampen-Kelley[2,3], J.R. Simpson[5,6], S. Nagler[4], D. Mandrus[2,3], A.R. Hight Walker[5] and R. Valdes Aguilar[1] *1. Physics, The Ohio State University, Columbus, OH, United States; 2. Materials Science and Engineering, University of Tennessee, Knoxville, TN, United States; 3. Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 4. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 5. Engineering Physics Division, Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 6. Physics, Astronomy, and Geosciences, Towson University, Towson, MD, United States*

2:18

BF-03. **Novel elementary spin excitations in metals.** *V. Antropov*[1], A. Wysocki[1] and A. Kutepov[2] *1. Ames Laboratory, Ames, IA, United States; 2. Brookhaven National Laboratory, Upton, NY, United States*

2:30

BF-04. **Critical behavior of the antiferromagnetic transitions in intermetallics R_3T (R=Dy, Tb, T=Co, Ni).** A. Herrero[1], *A. Oleaga*[1], A. Salazar[1], A. Gubkin[2,3] and N.V. Baranov[2,3] *1. Department of Applied Physics I, University of the Basque Country, Bilbao, Spain; 2. M.N. Miheev Institute of Metal Physics, Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russian Federation; 3. Institute of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, Russian Federation*

2:42

BF-05. **Magnetic Quantum-Phase Transition Caused by Interstitial Modification in $Co_{1+x}Sn$.** *R. Pahari*[1,2], B. Balasubramanian[1,2], R. Pathak[3], S. Valloppilly[1], R. Skomski[1,2], A. Kashyap[3] and D.J. Sellmyer[1,2] *1. Nebraska Center for Materials and Nanoscience, Lincoln, NE, United States; 2. Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States; 3. School of Basic Sciences, IIT Mandi, Mandi, India*

2:54

BF-06. **The phase transition in lightly doped Mott insulators.** *L. Dubovskii*[1] *1. Theoretical Dvision, NRC "Kurchatov Institute", Moscow, Russian Federation*

3:06

BF-07. **Local short-scale correlations and the origin of Pseudo-Diamagnetism.** *M. Tripathi*[1], T. Chatterji[2], S. Majumder[1], H. Fischer[2], R. Choudhary[1] and D. Phase[1] *1. Magnetism, UGC DAE Consortium for Scientific Research, Indore, India; 2. Institut Laue-Langevin, Grenoble, France*

3:18

BF-08. **Structural and magnetic properties of $PrIr_3B_2$ single crystal.** S. Manni[1], A. Thamizhavel[2] and *S.K. Dhar*[1] *1. Condensed Matter Physics & Materials Science, Tata Institute of Fundamental Research, Mumbai, India; 2. Condensed Matter Physics & Materials Science, Tata Institute of Fundamental Research, Mumbai, India*

3:30

BF-09. **Brillouin Light Scattering (BLS) Measurements of Vanadium Tetracyanoethylene (VTCNE).** ***(Invited)*** *K.E. Nygren*[1], D. Marchfield[1], G.A. Riley[1], A. Franson[2], T. Richter[2], M. Chilcote[2], E. Johnston-Halperin[2] and K. Buchanan[1] *1. Department of Physics, Colorado State University, Fort Collins, CO, United States; 2. Department of Physics, The Ohio State University, Columbus, OH, United States*

4:06

BF-10. **How do non-magnetic elements influence electronic structure to enhance magnetism and control phase transformation in rare earth compounds?** *D. Paudyal*[1] and V.K. Pecharsky[2,3] *1. Ames Laboratory, Ames, IA, United States; 2. Ames Laboratory, Ames, IA, United States; 3. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

4:18

BF-11. **Element-specific determination of the magnetic properties of the macrocyclic tetranucluer 3d-4f complexes with Cu_3Tb core by means of x-ray magnetic circular dichroism (XMCD).** K. Balinski[1], L. Schneider[1], J. Wöllermann[1], A. Buling[1], L. Joly[2], C. Piamonteze[3], H.L. Feltham[4], S. Brooker[4], A. Powell[5], B. Delley[3] and *K. Kuepper*[1] *1. Department of Physics, University of Osnabrück, Osnabrück, Germany; 2. CNRS, IPCMS, Université de Strasbourg, Strasbourg, France; 3. Paul Scherrer Institute, Villigen, Switzerland; 4. Department of Chemistry and the MacDiarmid Institute, University of Otago, Dunedin, New Zealand; 5. Institut für Anorganische Chemie, Karlsruhe Institute of Technology, Karlsruhe, Germany*

Session BG
MOTORS: DESIGN AND ANALYSIS I

Evangelos Hristoforou, Chair
National Technical University of Athens, Athens, Greece

BG-01. **Withdrawn**

1:30

BG-02. **A Nonlinear Four-dimensional Flux Linkage Modeling Method for Axial Flux Coil Assisted Stator Excitation BLDCM Based on Fourier Series.** A. Liu[1], *D. Ren*[1] and J. Lou[1] *1. College of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

1:42

BG-03. **A Consequent-Pole PM Magnetic-Geared Double-Rotor Machine with Flux-Weakening Ability.** *H. Zhao*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Kowloon, Hong Kong*

1:54

BG-04. **A Hybrid Interior Permanent Magnet Variable Flux Memory Machine Using Two-Part Rotor.** L. Wu[1], *Y. Zheng*[1] and Y. Fang[1] *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

2:06

BG-05. **Analytical prediction of iron losses in a spoke-type permanent magnet synchronous in-wheel motor for electric vehicles.** *P. Liang*[1,2], F. Chai[3], K. Shen[1,2] and W. Liu[1,2] *1. Department of Electrical Engineering, Northwestern Polytechnical University, Xi'an, China; 2. Shaanxi Key Laboratory of Small & Special Electrical Machine and Drive Technology, Xi'an, China; 3. Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*

2:18

BG-06. **A Distributed Winding Wound Field Pole Changing Vernier Machine for Variable Speed Application.** *N. Baloch*[1] and B. Kwon[1] *1. Electronic Systems Engineering, Hanyang University, Ansan, The Republic of Korea*

2:30

BG-07. **High Power-Density Axial Flux Rotational Machines with Metal Amorphous Nanocomposite (MANC) Soft Magnetic Material (SMM) and Rare Earth Free Permanent Magnets.** *S. Simizu*[1], P. Ohodnicki[2,1] and M.E. McHenry[1] *1. Carnegie Mellon University, Pittsburgh, PA, United States; 2. National Energy Technology Laboratory, Pittsburgh, PA, United States*

2:42

BG-08. Analysis and Comparison of Printed-Circuit Stator Windings for Axial Flux Permanent Magnet Machines. *M.D. Noh*[1], J. Kim[1] and Y. Park[1] *1. Mechatronics Engineering, Chungnam National University, Daejeon, The Republic of Korea*

2:54

BG-09. Matrix-Free Nonlinear Finite Element Solver using Transmission-Line Modeling on GPU. *P. Liu*[1] and V. Dinavahi[1] *1. Electrical and Computer Engineering, University of Alberta, Edmonton, AB, Canada*

3:06

BG-10. AC Loss and Thermal Analysis of Doubly Salient Electro-Magnetic Machine with Round, Flat and Litz Wire Windings. *J. Zhang*[1], Z. Zhang[1] and L. Yu[1] *1. College of Automation Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China*

3:18

BG-11. Consequent-Pole Hybrid Excitation Brushless Wound Field Synchronous Machine with Fractional Slot Concentrated Winding. *M. Ayub*[1], G. Sirewal[1] and B. Kwon[1] *1. Hanyang University, Ansan, The Republic of Korea*

3:30

BG-12. Mathematical Modeling and Verification of a 9-Phase Asymmetric Winding Permanent Magnet Synchronous Motor. *E. Yolacan*[1], M. Aydin[1] and M. Guven[2] *1. Mechatronics Engineering, Kocaeli University, Kocaeli, Turkey; 2. Schlumberger Limited, Sugar Land, TX, United States*

TUESDAY AFTERNOON 1:30 | WASHINGTON 2

Session BH
PATTERNED FILMS
Nick Rizzo, Chair
Northrop Grumman Corporation, Tempe, AZ, United States

1:30

BH-01. Engineering Spins in Nanostructured Complex Oxides. ***(Invited)*** M.S. Lee[1], R.V. Chopdekar[1,2], B. Li[1], A. Scholl[2], A. Young[2], S. Retterer[3], E. Folven[4], J. Grepstad[4] and *Y. Takamura*[1] *1. Materials Science and Engineering, University of California, Davis, Davis, CA, United States; 2. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. Center for Nanophase Materials Science, Oak Ridge National Laboratory, Oak Ridge, CA, United States; 4. Electronics and Telecommunications, Norwegian University of Science and Technology, Trondheim, Norway*

2:06

BH-02. Ion Irradiation Induced Cobalt/Cobalt Oxide Heterostructures: From Materials to Devices. *D. Hilliard*[1,2], O. Yildirim[1,3], C. Fowley[1], S. Arekapudi[2], H. Cansever[1,4], R. Böttger[1], G. Hlawacek[1], O. Hellwig[2], J. Lindner[1], J. Fassbender[1,4] and A. Deac[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Institute of Physics, Chemnitz University of Technology, Chemnitz, Germany; 3. Empa-Swiss Federal Laboratories for Materials Science and Technology, 8600 Dübendorf, Switzerland; 4. Institute of Physics of Solids, Dresden University of Technology, Dresden, Germany*

2:18

BH-03. Exchange Bias Properties of Ferromagnetic/Antiferromagnetic Square Nanodots: a Monte Carlo Investigation. *H. Kanso*[1], D. Ledue[1] and R. Patte[1] *1. Normandie Universite, UNIROUEN, INSA Rouen, CNRS, GPM, 76800 St Etienne du Rouvray, France*

2:30

BH-04. Strong Interlayer Magnon-Magnon Coupling in Magnetic Hybrid Nanostructures. *(Invited)* J. Chen[1], C. Liu[1], T. Liu[2], Y. Xiao[3], K. Xia[4], G. Bauer[5,6], M. Wu[2] and *H. Yu*[1] *1. Beihang University, Beijing, China; 2. Colorado State University, Fort Collins, CO, United States; 3. Nanjing University of Aeronautics and Astronautics, Nanjing, China; 4. Beijing Normal University, Beijing, China; 5. Tohoku University, Sendai, Japan; 6. University of Groningen, Groningen, Netherlands*

3:06

BH-05. Direct Observation of Magnetic Long-range Order in Ammann-Beenker Artificial Quasicrystals. *B.W. Farmer*[1], J. Unguris[2], J.S. Woods[1] and L.E. De Long[1] *1. Department of Physics and Astronomy, University of Kentucky, Lexington, KY, United States; 2. Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, MD, United States*

3:18

BH-06. Using Square Artificial Spin Ice as a Model for Avalanche Physics. *N.S. Bingham*[1], J. Park[2], X. Zhang[1], J.D. Watts[3,4], C. Leighton[4] and P. Schiffer[1] *1. Department of Applied Physics, Yale University, New Haven, CT, United States; 2. Department of Physics, University of Illinois, Urbana-Champaign, IL, United States; 3. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 4. Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

3:30

BH-07. **Field-driven mobility and linear creep of emergent monopoles in square artificial spin ice.** S.A. Morley[2,1], J. Porro[4,3], A. Hrabec[2,5], M.C. Rosamond[6], E. Linfield[6], M. Im[7,8], P. Fischer[9,1], S. Langridge[4] and *C.H. Marrows*[2] *1. Department of Physics, UC Santa Cruz, Santa Cruz, CA, United States; 2. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 3. BCMaterials, Derio, Spain; 4. ISIS, STFC Rutherford Appleton Laboratory, Didcot, United Kingdom; 5. Mesoscopic Systems, Paul Scherrer Institute, Villigen, Switzerland; 6. School of Electronic and Electrical Engineering, University of Leeds, Leeds, United Kingdom; 7. Center for X-ray Optics, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 8. Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Republic of Korea; 9. Materials Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

3:42

BH-08. **MFM Study of Magnetic Charge Order in Fibonacci-Distorted, Honeycomb Artificial Spin Ice.** *J.S. Woods*[1], B.W. Farmer[1], Y. Wang[2], W. Kwok[3], J. Hastings[1] and L.E. De Long[1] *1. Physics and Astronomy, University of Kentucky, Lextington, KY, United States; 2. Physics, Nanjing University, Nanjing, China; 3. Material Science, Argonne National Laboratory, Lemont, IL, United States*

3:54

BH-09. **Thermal fluctuations in macroscopically degenerate artificial square ice.** *A. Farhan*[1,2], M.D. Saccone[3], C.F. Petersen[4], S. Dhuey[5], M. Alava[6], A. Scholl[1] and S. van Dijken[6] *1. Advanced Light Source, Lawrence Berkeley National Lab, Berkeley, CA, United States; 2. Paul Scherrer Institute, Villigen, Switzerland; 3. Department of Physics, UC Santa Cruz, Santa Cruz, CA, United States; 4. University of Innsbruck, Innsbruck, Austria; 5. Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 6. Aalto University, Espoo, Finland*

4:06

BH-10. **Thin films solid-state dewetting for physical synthesis of FePd magnetic nanoparticles.** G. Barrera[1], F. Celegato[1], M. Coisson[1], M. Cialone[1,2], P. Rizzi[2] and *P. Tiberto*[1] *1. Nanoscience and Materials, INRIM, Torino, Italy; 2. Chemistry, Università di Torino, Torino, Italy*

4:18

BH-11. **Enhancing ultra-thin films with perpendicular anisotropy at the atomic scale using light ion irradiation.** L. Herrera Diez[1], M. Sall[1], N. Vernier[1], M. Belmeguenai[2], Y. Roussigné[2], A. Stashkevich[2], S. Cherif[2], G. Durin[3], A. Casiraghi[3], J. Langer[4], B. Ocker[4] and *D. Ravelosona*[1,5] *1. University of Paris Sud, Paris Saclay, CNRS, Center for Nanoscience and Nanotechnology, Orsay, France; 2. University Paris 13, Villetaneuse, France; 3. Instituto Nazionale di Ricerca Metrologica, Torino, Italy; 4. SINGULUS AG, Kahl am Main, Germany; 5. Spin-Ion Technologies, Orsay, France*

Session BI
RARE-EARTH INTERMETALLICS AND COMPOUNDS II
Dimitrios Niarchos, Chair
NCSR Demokritos, Athens, Greece

1:30

BI-01. **Single Crystal Permanent Magnet: Extraordinary Magnetic Behavior in the Ta, Cu and Fe Substituted $CeCo_5$ System. *(Invited)*** *A. Palasyuk*[1], T.N. Lamichhane[2], M. Onyszczak[2], O. Palasyuk[3], S.L. Bud'ko[2,1] and P.C. Canfield[2,1] *1. Ames Laboratory, Ames, IA, United States; 2. Physics, Iowa State University, Ames, IA, United States; 3. Department of Material Science, Iowa State University, Ames, IA, United States*

2:06

BI-02. **A Study of the Transitional Paths to Ordering in $L1_0$ Compounds.** *N. Maât*[1], I.J. McDonald[1], S. Keshavarz[1] and L.H. Lewis[1] *1. Chemical Engineering, Northeastern University, Boston, MA, United States*

2:18

BI-03. **Metamagnetic Behavior in $L1_0$-MnAl Synthesis by the Post Annealing of Electrodeposited MnAl Powder.** *S. Sato*[1], S. Irie[1], Y. Nagamine[1] and Y. Tanaka[1] *1. TDK Corporation, Narita, Japan*

2:30

BI-04. **Magnetic and Structural Properties of $L1_0$-$Mn_{50}Ga_{50-x}Al_x$ Epitaxially Grown Thin Films.** *K. Kamiya*[1,2], S. Zhao[1,2], Y. Tanaka[2], G.J. Mankey[1] and T. Suzuki[1] *1. Center for Materials for Information Technology (MINT), The University of Alabama, Tuscaloosa, AL, United States; 2. Materials Development Center, Technology & IP HQ, TDK Corporation, TDK Corporation, Narita, Japan*

2:42

BI-05. **Evaluation on Effects of α_2-Phase on Coercivity of Alnico.** *H. Won*[1], Y. Hong[1], M. Choi[1], W. Lee[1] and G.J. Mankey[2] *1. Department of Electrical and Computer Engineering and MINT Center, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Physics and Astronomy and MINT Center, The University of Alabama, Tuscaloosa, AL, United States*

2:54

BI-06. **Semi-Hard Magnetic Nanocomposites Based on Out-of-Equilibrium $NbFe_{2+\delta}$ and $TaFe_{2+\delta}$ Laves Phases.** A. Gabay[1] and *G. Hadjipanayis*[1] *1. University of Delaware, Newark, DE, United States*

3:06

BI-07. **Enhanced coercivity in $Sm_2Fe_{17}N_3$ magnets.** *Y. Shen*[1,3], S. Leontsev[1,3], M.V. McLeod[1,3], G. Kozlowski[2,3], R. Wheeler[2,3], J. Horwath[3] and Z. Turgut[3] *1. University of Dayton, Dayton, OH, United States; 2. UES Inc., Dayton, OH, United States; 3. Air Force Research Laboratory, Wright-Patterson Air Force Base, OH, United States*

3:18

BI-08. **Towards realization of the $SmFe_{5-2x}(CoNi)_x$ (0< x <1) hard magnetic phase by employing the High Entropy Alloy Concept: Special case $SmFe_3CoNi$.** *D. Niarchos*[1,2], V. Psycharis[1], A. Kaidatzis[1], E. Devlin[1], M. Gjokas[1], M. Pissas[1] and G. Gkouzias[2] *1. INN, NCSR Demokritos, Aghia Paraskevi, Greece; 2. R&D, Amen Tdchnologies, Aghia Paraskevi, Greece*

3:30

BI-09. **Increased Maximum Energy Product for 40 Atomic% Yttrium Substituted $Sm_2Fe_{17}N_x$ Magnets and Alternating Coexistence of Two Kinds of RE_2Fe_{17} Phases in $(Sm_{0.6}Y_{0.4})_2Fe_{17}N_x$ with Annealing Temperature of 1000 °C.** *J. Xu*[1], J. Zheng[1], H. Chen[1], L. Qiao[1], Y. Ying[1], W. Cai[1], W. Li[1], J. Yu[1], M. Lin[2] and S. Che[1] *1. Zhejiang University of Technology, Hangzhou, China; 2. Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, Ningbo, China*

3:42

BI-10. **Structure and magnetism of high-anisotropy R_2T_7 –type rare earth (R)-transition metal (T) alloys.** *B. Das*[1], R. Choudhary[1], D. Paudyal[1] and R. Ott[1] *1. Ames Laboratory, U.S. Department of Energy, Iowa State University, Ames, IA, United States*

3:54

BI-11. **Sm-Fe-V based $ThMn_{12}$-type Permanent Magnets.** *A.M. Schönhöbel*[1,2], R. Madugundo[1], A. Gabay[3], J. Barandiaran[2] and G. Hadjipanayis[3] *1. BCMaterials, Leioa, Spain; 2. Electricity & Electronics, University of Basque Country, Leioa, Spain; 3. Physics and Astronomy, University of Delaware, Newark, DE, United States*

4:06

BI-12. **Structural and magnetic properties of $(Sm,R)(Fe,Co)_{11.4}Ti_{0.6}$ (R = Y, Zr) with $ThMn_{12}$ structure.** *M. Hagiwara*[1], N. Sanada[1] and S. Sakurada[1] *1. Toshiba Corporation, Kawasaki, Japan*

4:18

BI-13. **Microstructures and Magnetic Properties of Grain Boundary Modified $Sm(Fe_{0.8}Co_{0.2})_{11}Ti$ Bulk Materials.** *J. Park*[1], H. Qian[1], J. Lim[1], J. Kim[1] and C. Choi[1] *1. Powder & Ceramic Division, Korea Institute of Materials Science, Changwon, The Republic of Korea*

Session BJ

MAGNETIC FIELDS AND CELLULAR RESPONSE (Poster Session)

Ravi Hadimani, Chair
Virginia Commonwealth University, Richmond, VA, United States

BJ-01. **Deformation of cellular components within bone forming cells when exposed to a magnetic field.** *M. Iwasaka*[1] *1. Hiroshima University, Higashihiroshima, Japan*

BJ-02. **Study of Poly(N-Isopropyl Acrylamide) Electrospinning Magnetic Fiber As A Cell Attach/Detach Substrate.** *T. Chen*[1] and T. Ger[1] *1. Chung Yuan Christian University, Taoyuan City, Taiwan*

BJ-03. **Evaluation of bacteria using switching magnetic field.** *S. Yabukami*[1,2], H. Onodera[2], Y. Sato[2], K. Miyauchi[2], G. Endo[2], M. Furuya[1], H. Kanetaka[1], Y. Miura[3], H. Takahashi[3] and T. Kodama[3] *1. Tohoku University, Sendai, Japan; 2. Tohoku Gakuin University, Tagajo, Japan; 3. JNS Co., Ltd., Natori, Japan*

BJ-04. **Generation of tunable frequency, monophasic pulsed magnetic fields for low-field applications.** N. Prabhu Gaunkar[1], W. Theh[1], T. Kimler[1], *D.C. Jiles*[1], R. Weber[1] and M. Mina[1,2] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Industrial Design, Iowa State University, Ames, IA, United States*

BJ-05. **Research on Interference Effect of Magnetic Nanoparticles in Magnetic Field on Lung Cancer Cells.** N. Zhang[1], S. Ning[2], *S. Wang*[1], C. Zhang[3], S. Wang[1] and Y. Wang[4] *1. State Key Laboratory of Electrical Insulation and Power Equipment, Faculty of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China; 2. College of Electrical and Information Engineering, Shaanxi University of Science and Technology, Xi'an, China; 3. Department of Oncology, Johns Hopkins University School of Medicine, Baltimore, MD, United States; 4. School of Life Sciences, Northwestern Polytechnical University, Xi'an, China*

BJ-06. **Intense light scattering by cooperative relaxation of magnetically aligned organic crystal particles.** *K. Baba*[1] and M. Iwasaka[1] *1. Hiroshima University, Higashihiroshima, Japan*

BJ-07. **Effects of pulsed magnetic fields on cilia of comb jelly.** *Y. Fukagawa*[1] and M. Iwasaka[1] *1. Hiroshima University, Higashihiroshima, Japan*

BJ-08. **Quantitative Analysis of Unconsciousness in ELF-Inducing Flickering Light Sensation.** *H. Nakagawa*[1] and S. Ueno[2] *1. Department of Electrical and Electronic Engineering, Tokyo Denki University, Tokyo, Japan; 2. Department of Applied Quantum Physics, Kyushu University, Fukuoka, Japan*

BJ-09. **Human Reliability Measurements during Extremely Low Frequency Magnetic Stimuli.** *H. Nakagawa*[1] and S. Ueno[2] *1. Department of Electrical and Electronic Engineering, Tokyo Denki University, Tokyo, Japan; 2. Department of Applied Quantum Physics, Kyushu University, Fukuoka, Japan*

TUESDAY
AFTERNOON
2:30

EXHIBIT HALL A

Session BK
MOTORS IN AUTOMOTIVE APPLICATIONS (Poster Session)

Yang-Ki Hong, Chair
University of Alabama, Tuscaloosa, AL, United States

BK-01. **Practical Investigation of Motor Reconfiguration for On-board Chargers.** *Y. Xiao*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong, Hong Kong*

BK-02. **New Hybrid Stator Design for High Speed PMSMS Based on Selective Laser Melting of 3D Printing.** *P. Huang*[1], M. Tsai[2,1] and I. Jiang[1] *1. Electrical Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan*

BK-03. **Comparative Study between a Novel Multi-Tooth and a V-Shaped Flux-Switching Permanent Magnet Machines.** G. Zhao[1] and *W. Hua*[1] *1. School of electrical engineering, Southeast University, Nanjing, China*

BK-04. **A Double-Rotor Dual-PM-Excited Electrical Machine for Multimotor New Energy Vehicles.** *Y. Chen*[1] and W. Fu[1] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

BK-05. **A Novel High Torque Density PM Vernier Motor with Trapezoidal Magnets and Flux Barriers for In-wheel Direct Drive Application.** *Y. Yu*[1] and F. Chai[1] *1. Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

BK-06. **Comparative Analysis and Experiment of High Speed Motor for Electric Turbo Charger According to Current waves.** *D. Hong*[1,2], T. Lee[2], Y. Jeong[1] and J. Ahn[3] *1. Electric Machines and Drives Research Center, Korea Electrotechnology Research Institute, Changwon, The Republic of Korea; 2. Energy and Power Conversion Engineering, University of Science and Technology, Changwon, The Republic of Korea; 3. School of Mechatronics, Kyungsung Univeristy, Busan, The Republic of Korea*

BK-07. **Comparative Analysis of Novel V-Shaped and U-Shaped Consequent Pole PM Vernier Motors with High Torque Density for In-wheel Direct Drive Application.** Y. Yu[1] and *F. Chai*[1] *1. Harbin Institute of Technology, Harbin, China*

BK-08. **Analysis of Saliency in Modular Fractional Slot Interior PM Machines with Concentrated Windings.** *Z. Zhang*[1] *1. Electrical and Computer Engineering, The Ohio State University, Columbus, OH, United States*

BK-09. **Low Cost Direct Drive Ferrite PM-Assisted Modular Synchronous Reluctance Generator for Wind Power Applications.** *Z. Zhang*[1] *1. Electrical and Computer Engineering, The Ohio State University, Columbus, OH, United States*

BK-10. **A Novel Wide-Speed-Range Permanent Magnet Motor with Adjustable Winding Factor.** Y. Liu[1], X. Zhang[2] and *S. Niu*[3] *1. Huaqiao University, Xiamen, China; 2. Shenzhen In Drive Amperex Co. Ltd, Shenzhen, China; 3. The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

TUESDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session BL
MOTORS IN WIND AND WAVE APPLICATIONS (Poster Session)

Kais Atallah, Chair
University of Sheffield, Sheffield, United Kingdom

BL-01. **Development of Fully Superconducting Wind Generator with Air-core and SC shield coils.** *D. Lee*[1], T. Balachandran[1] and K. Haran[1] *1. Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States*

BL-02. **A Multiphase Tubular Fault-Tolerant PM Linear Machine with High Magnetic Isolation Ability.** *Y. Sui*[1], P. Zheng[1] and Z. Yin[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

BL-03. **Hybrid Analysis of Vibration Displacement of a Balanced Armature Receiver.** *D. Xu*[1], Y. Jiang[2] and S. Hwang[2] *1. School of Mechatronic Engineering and Automation, Shanghai University, Shanghai, China; 2. School of Mechanical Engineering, Pusan National University, Busan, The Republic of Korea*

BL-04. **An Improved Brushless Doubly-fed Generator with Interior PM Rotor for Wind Power Application.** *J. Zhang*[1], Y. Jiang[1], J. Zhao[1] and X. Hu[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

BL-05. **Experimental Verification of Operation Characteristics of Wound Rotor Synchronous Generator according to Rotor Design.** *Y. Park*[1], C. Kim[1] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*

BL-06. **Research on Vibration Reduction of Switched Reluctance Motor.** *R. Yan*[1,2], J. Chen[1,2] and Y. Gao[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

BL-07. **Design of a Permanent Magnet Homopolar Machine for Flywheel Energy Storage System.** *Z. Liu*[1] and K. Wang[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

BL-08. **A Novel Modular Stator Hybrid Excited Doubly Salient Synchronous Machine with Stator Slot Permanent Magnets.** *M. Zheng*[1], Z. Zhu[1] and S. Cai[1] *1. University of Sheffield, Shffield, United Kingdom*

BL-09. **Withdrawn**

BL-10. **Design and Experimental Results of Flywheel Energy Storage System Suitable for Target Capacity and Operation Time.** *H. Lee*[1], J. Cho[1], C. Lee[1], H. Kim[1] and G. Park[1] *1. Pusan National University, Busan, The Republic of Korea*

TUESDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session BM
SOFT MAGNETIC COMPONENTS: WIRELESS POWER (Poster Session)

Julian Gonzalez, Co-Chair
Universidad de Pais Vasco (UPV/EHU), Leioa, Spain
Lourdes Dominguez, Co-Chair
Universidad de Pais Vasco (UPV/EHU), Leioa, Spain

BM-01. **Influence of Medium with Magnetic or Electric Properties Located Between Coils in Magnetic Resonant Wireless Power Transfer.** *H. Lee*[1], H. Jeong[1] and G. Park[1] *1. Pusan National University, Busan, The Republic of Korea*

BM-02. **Design and Analysis of Quasi-Omnidirectional Dynamic Wireless Power Transfer for Fly-and-Charge.** *W. Han*[1], K. Chau[1], C. Jiang[1] and W. Liu[1] *1. EEE Department, The University of Hong Kong, Hong Kong*

BM-03. **Human Exposure to Magnetic Leakage from DDP Type Wireless Charging System for Electric Vehicle.** *F. Wen*[1], T. Wang[1], L. Liu[2], R. Li[1] and L. Liu[1] *1. Nanjing University of Science and Technology, Nanjing, China; 2. MIGU Co., Ltd (Subsidiary of China Mobile), Nanjing, China*

BM-04. **Power Allocation for Dynamic Dual-Pickup Wireless Charging System of Electric Vehicle.** *Y. Huang*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Kowloon, Hong Kong*

BM-05. **Transmission Efficiency Analysis of Wireless Power Transmission System with Variable Inductance Regulated by DC.** *R. Yan*[1,2], X. Guo[1,2] and S. Cao[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

BM-06. **Design and Implementation of Metamaterial-Based In-flight Wireless Charging for Drones.** B. Zhang[1], Z. Zhang[1], S. Zhao[1], H. Wu[2], W. Han[3] and *W. Liu*[3] *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China; 2. School of Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States; 3. Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong, Hong Kong*

BM-07. **Analysis of Power Variations in Magnetic Resonant Wireless Power Transmission by the Area of the Receiver Coil.** *H. Jeong*[1] and G. Park[1] *1. Department of Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*

BM-08. **AC Resistance Reduction of a Flexible Wireless Power Transmission Coil Using Magnetic Path Control Technology at 13.56 MHz.** *Y. Tokudaiji*[1], D. Miura[1], Y. Hattori[1], K. Murasato[1], Y. Bu[1] and T. Mizuno[1] *1. Faculty of Engineering, Shinshu University, Nagano, Japan*

BM-09. **Investigation of Structure and Material for the Back Yoke at 13.56 MHz Wireless Power Transfer for High Transmission Efficiency.** *D. Miura*[1], Y. Tokudaiji[1], Y. Hattori[1], K. Murasato[1], Y. Bu[1] and T. Mizuno[1] *1. Faculty of Engineering, Shinshu University, Nagano, Japan*

BM-10. **A study on using scale model of wireless power supply system during EV running corresponding to vehicle magnetic fluctuation.** *T. Abe*[1], F. Sato[1], S. Miyahara[1], K. Ishikawa[1], S. Oba[1] and Y. Hongo[1] *1. Tohoku Gakuin University, Tagajyo, Japan*

Session BN
MULTIFERROICS AND COMPLEX OXIDES II (Poster Session)

Margo Staruch, Chair
U.S. Naval Research Laboratory, Washington, DC, United States

BN-01. **Possible origin of "paramagnetism" in polar metal $LiOsO_3$: Quenched static magnetic moment due to strong spin-orbit coupling.** *Y. Zhang*[1], C. Li[1], J. Gong[1], S. Dong[2] and Z. Yan[1] *1. Nanjing University, Nanjing, China; 2. Southeast University, Nanjing, China*

BN-02. **Direct Observation of Ferroelectricity in $CaMn_7O_{12}$ Thin Films.** P. Jain[1] and *R. Chatterjee*[1] *1. Physics, IIT DELHI, New Delhi, India*

BN-03. **Influence of Zinc Substitution on Self-Biased Magnetoelectric Gyrators.** *J. Zhang*[1], D. Chen[1], Q. Zhang[1], L. Jiang[1], X. Hang[1], K. Li[1], W. Zhu[1] and L. Cao[1] *1. Zhengzhou University of Light Industry, Zhengzhou, China*

BN-04. **Transition metal valence states and magnetic structure of the frustrated $ABaM_4O_7$ (A=Y,Ca; M=Co,Fe,Zn) system.** V.R. Galakhov[2], D.I. Turkin[3], V.V. Mesilov[3], S.N. Shamin[2], G.V. Bazuev[3] and *K. Kuepper*[1] *1. Department of Physics, University of Osnabrück, Osnabrück, Germany; 2. Ural Branch of the Russian Academy of Sciences, 1M. N. Mikheev Institute of Metal Physics, Yekaterinburg, Russian Federation; 3. Ural Branch of the Russian Academy of Sciences, Institute of Solid State Chemistry, Yekaterinburg, Russian Federation*

BN-05. **Magnetic Anisotropy in $La_{0.7}Sr_{0.3}CoO_3$ Films Regulated by Strain-Induced e_g-orbital Rearrangement.** J. Li[1,2], *J. Wang*[1,2], K. Qiao[1,2], Y. Liu[1,2], F. Hu[1,2], J. Sun[1,2] and B. Shen[1,2] *1. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing 100049, China*

BN-06. **Spin orbit torque engineering via oxygen vacancies in a multiferroic $BiFeO_3$ based heterostructure.** *P. Liu*[1], J. Miao[1], K. Meng[1], Y. Wu[1], J. Chen[1], X. Xu[1] and Y. Jiang[1] *1. University of Science and Technology Beijing, Beijing, China*

BN-07. **Enhancement Mechanism of Magnetization for Hexagonal $YCr_xMn_{1-x}O_3$ Multiferroic Nanoparticles.** J. Cui[1], *A. Zhang*[1], J. Shi[1], H. Cao[1], X. Wu[2] and Y. Zhang[3] *1. College of Science, Hohai University, Nanjing, China; 2. National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing, China; 3. School of Science, Jiangsu University of Science and Technology, Zhenjiang, China*

BN-08. **Large interfacial magnetostriction in $(Co/Ni)_4$/piezoelectric multiferroic heterostructures.** *D.B. Gopman*[1], P.J. Chen[2,1], J.W. Lau[1], A.C. Chavez[4], G. Carman[4], P. Finkel[3], M. Staruch[3] and R. Shull[1] *1. Materials Science & Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Western Digital, Fremont, CA, United States; 3. Materials Science and Technology, US Naval Research Laboratory, Washington, DC, United States; 4. Mechanical and Aerospace Engineering, University of California Los Angeles, Los Angeles, CA, United States*

BN-09. **Coexistence of long range ferromagnetism and glassy behavior in double perovskite La_2CoMnO_6.** *R. Madhogaria*[1], R. Das[1], E. Clements[1], V. Kalappattil[1], N. Dang[2], D. Kozlenko[3], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Institute of Research and Development, Duy Tan University, Da Nang, Vietnam; 3. Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research, Dubna, Russian Federation*

BN-10. **Giant zero-biased magnetoelectric coupling properties of flexible composites based on FeCuNbSiB nanocrystalline.** X. He[1], *J. Qiu*[1], Y. Long[1], Q. Chang[1], H. Liu[1], X. Wang[2], X. Tang[1], W. Hu[1] and Y. She[1] *1. Key Laboratory of Optoelectronic Technology & Systems of the Education Ministry of China, College of Optoelectronic Engineering, Chongqing University, Chongqing, China; 2. School of optical and electronic information, Huazhong University of Science and Technology, Wuhan, China*

TUESDAY AFTERNOON 2:30 | EXHIBIT HALL A

Session BO
TOPOLOGICAL SPIN TEXTURES I (Poster Session)

Seonghoon Woo, Chair
Korea Institute of Science and Technology (KIST), Seoul, The Republic of Korea

BO-01. **Lorentz TEM Investigation of Dzyaloshinskii Domain Walls in Pt/Co/Ni/Ir Based Multi-Layers with Tunable Interface Properties.** *M.P. Li*[1], M. De Graef[1] and V. Sokalski[1] *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

BO-02. **A comparison of Dzyaloshinskii-Moriya interaction detection techniques in Pt/Co/Ir multilayers.** *J.A. Brock*[6], P. Vallobra[4], A.K. Chaurasiya[5], K.E. Nygren[3], A. Cao[1], P. Domenichini[2] and E. Fullerton[6] *1. Fert Beijing Institute, Beihang University, Beijing, China; 2. Universidad de Buenos Aires, Buenos Aires, Argentina; 3. Department of Physics, Colorado State University, Ft. Collins, CO, United States; 4. Institut Jean Lamour, University of Lorraine, Nancy, France; 5. S.N. Bose National Center for Basic Sciences, Kolkata, India; 6. Center for Memory and Recording Research, University of California, San Diego, La Jolla, CA, United States*

BO-03. **Field manipulation of Bloch points in helimagnetic nanostructures.** *M. Beg*[1,2], D.I. Cortés-Ortuño[2], R.A. Pepper[2], O. Hovorka[2] and H. Fangohr[1,2] *1. European XFEL GmbH, Schenefeld, Germany; 2. University of Southampton, Southampton, United Kingdom*

BO-04. **Field-like torque switching and antidamping torque switching in a biaxial metallic antiferromagnet.** *X. Zhou*[1], X. Chen[1], J. Zhang[2], G. Shi[1], F. Li[1], F. Pan[1] and C. Song[1] *1. Tsinghua University, Beijing, China; 2. Huazhong University of Science and Technology, Wuhan, China*

BO-05. **Antidamping-torque-induced switching in biaxial antiferromagnetic insulators.** *X. Chen*[1], R. Zarzuela[2], J. Zhang[3], C. Song[1], W. Jiang[1], F. Pan[1] and Y. Tserkovnyak[2] *1. Tsinghua University, Beijing, China; 2. University of California, Los Angeles, Los Angeles, CA, United States; 3. Huazhong University of Science and Technology, Wuhan, China*

BO-06. **Anomalous Hall Effect in Mn_3Sn Polycrystalline Thin Film.** *S. Oh*[1], T. Morita[1], T. Ikeda[3], M. Oogane[3], Y. Ando[3] and M. Tsunoda[2] *1. Future Technology Research Laboratory, ULVAC, Inc., Tsukuba, Japan; 2. Department of Electronic Engineering, Tohoku University, Sendai, Japan; 3. Department of Applied Physics, Tohoku University, Sendai, Japan*

BO-07. **Modulated Topological Hall Effect in Pt/YIG Bilayers.** *Q. Liu*[1], K. Meng[1], Y. Wu[1], J. Chen[1], Z. Li[1], J. Miao[1], X. Xu[1] and Y. Jiang[1] *1. University of Science and Technology Beijing, Beijing, China*

BO-08. **Discretization Effects in the Helimagnon Resonance of a Chiral Spin Soliton Lattice.** *Y. Shimamoto*[1], F. Goncalves[1,2], Y. Kousaka[3,2] and Y. Togawa[1,2] *1. Osaka Prefecture University, Osaka, Japan; 2. Chirality Research Center, Hiroshima, Japan; 3. Okayama University, Okayama, Japan*

BO-09. **Spin Wave Propagation in a Monoaxial Chiral Helimagnetic Crystal.** F. Goncalves[1,2], *Y. Shimamoto*[1], Y. Kousaka[3,2] and Y. Togawa[1,2] *1. Osaka Prefecture University, Osaka, Japan; 2. Chirality Research Centre, Hiroshima, Japan; 3. Okayama University, Okayama, Japan*

BO-10. **Control of magnetic domain in Pt/Co/MgO trilayer with Ru insertion layer.** *T. Nozaki*[1], M. Konoto[1], T. Nozaki[1], H. Kubota[1], A. Fukushima[1] and S. Yuasa[1] *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

Session BP

MAGNETO-CALORIC, MAGNETO-ELASTIC AND MAGNETO-OPTICAL MATERIALS (Poster Session)

Karl Sandeman, Chair
Brooklyn College of The City University of New York, Brooklyn, NY, United States

BP-01. **Fabrication of $(Y,Ce)_3(Fe,Al)_5O_{12}$ films for integrated magnetooptical Q-switch.** *S. Nakata*[1], T. Goto[1,2], R. Morimoto[1], T. Yoshimoto[1], Y. Nakamura[1], H. Uchida[1] and M. Inoue[1] *1. Toyohashi University Technology, Toyohashi, Japan; 2. JST PRESTO, Kawaguchi, Japan*

BP-02. **Photomagnetic and spectroscopic properties of Er and Yb co-doped $La_{0.7}Sr_{0.3}MnO_3$.** R. Martinez[1], N. Kumar[1], H. Huhtinen[2] and *R. Palai*[1] *1. Physics, University of Puerto Rico, San Juan, PR, United States; 2. Wihuri Physical Laboratory, Department of Physics and Astronomy, University of Turku, Turku, Finland*

BP-03. **Near-infrared magneto-optical reflectance changes for antiferro-magnetically exchange-coupled Co/Ru multilayer films.** *S. Saito*[1], H. Sato[1], K. Ooki[1], S. Kinno[2], K. Akahane[1] and H. Uchida[3] *1. Graduate School of Engineering, Tohoku Univ., Sendai, Japan; 2. Department of Engineering, Tohoku Univ., Sendai, Japan; 3. Department of Electrical and Electronic Information Engineering, Toyohashi Univ. of Technology, Toyohashi, Japan*

BP-04. **Imaging the magnetic phase transformation in Ni-Co-Mn-In magnetic shape memory alloy.** *H. Yang*[1], B. Wang[1] and R. Li[1] *1. Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China*

BP-05. **Scattering of Acoustic Waves from 1D Arrays of Magnetic Inclusions.** Y. Gusieva[1], *O. Latcham*[2], A. Shytov[2], O. Gorobets[1] and V.V. Kruglyak[2] *1. National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine; 2. University of Exeter, Exeter, United Kingdom*

BP-06. **Magnetocaloric Effect in the Triangulated Kagome Lattice $Cu_9X_2(cpa)_6$.** *S.F. Skinner*[1], R.A. Coro[1], W.M. Farmer[1], J. Lovett[1], J.C. Lupton[1], J. Moses[1], B.M. Ortolano[1], L.R. Reid[1], J.D. Taylor[1] and L.W. Ter Haar[1] *1. Chemistry, University of West Florida, Pensacola, FL, United States*

BP-07. **Anomalous Nernst Effect in FeNi epitaxial thin films.** *L. Ma*[1], Y. Zhang[1], H. Zhao[1], H. Fu[1], M. Tang[2], L.H. Yang[2], Z. Shi[2], N. Tian[1] and C. You[1] *1. Xi'an University of Technology, Xi'an, China; 2. Tongji University, Shanghai, China*

BP-08. **Hydrostatic pressure effects on magnetic transition and magnetocaloric effect in $Ho_{0.6}Er_{0.4}Co_2$ alloys.** *J. Hao*[1,2], F. Liang[2,3], J. He[1], F. Hu[2,3], J. Wang[2,3], J. Sun[2,3] and B. Shen[2,3] *1. Division of Functional Material Research, Central Iron and Steel Research Institute, Beijing, China; 2. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China; 3. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

BP-09. **Hydrostatic pressure-tuned magnetocaloric effect and multicaloric response in $MnNi_{1-x}Fe_xSi_{1-y}Ge_y$.** *F. Shen*[1,2], F. Liang[1,2], F. Hu[1,2], J. Hao[1], J. Wang[1,2], J. Sun[1,2] and B. Shen[1,2] *1. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

TUESDAY AFTERNOON 2:30 | EXHIBIT HALL A

Session BQ
SOFT MAGNETIC MATERIALS II: FERRITES AND GARNETS (Poster Session)

Ogheneyunume (Yunume) Obi, Chair
Northeastern University, Boston and Burlington, MA, United States

BQ-01. **Temperature Dependent Cation Distribution and Magnetic Ordering in $NiFe_{2-x}R_xO_4$ (x = 0 and 0.075; R= Y, Dy, Yb and Lu) Compounds.** *K. Ugendar*[1,2], P. Gorria[3], J.A. Blanco[3], G. Cuello[4] and G. Markandeyulu[2] *1. Applied Physics, Jabalpur Engineering College, Jabalpur, India; 2. Physics, Indian Institute of Technology Madras, Chennai, India; 3. Physics, University of Oviedo, Oviedo, Spain; 4. DS, Institut Laue Langevin, Grenoble, France*

BQ-02. **The BBSZ glass doping YIG possesses low ferromagnetic resonance loss.** *N. Jia*[1] and H. Zhang[1] *1. University of Electronic Science and Technology of China, Chengdu, China*

BQ-03. **Substrate Diffusion Effects on Cobalt Ferrite.** *A. Cruz*[1], J. Schwartz[2] and J. Jones[1] *1. Material Science Engineering, North Carolina State University, Raleigh, NC, United States; 2. Material Science Engineering, Penn State, State College, PA, United States*

BQ-04. **Fabrication and Magnetic Properties of Sintered Soft Magnetic Metallic Composites.** *K. Lee*[1], M. Choi[1] and J. Kim[1] *1. Hanyang University, Ansan, The Republic of Korea*

BQ-05. **Low Core Loss with High Initial Magnetic Permeability in Ni, Ti and Sn Co-doped Manganese Zinc (MnZn) Ferrites.** *Z. Zhang*[1], Y. Chen[2], Y. Yao[2], P. Andalib[1] and V.G. Harris[1] *1. Center for Microwave Magnetic Materials and Integrated Circuits, Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, United States; 2. Innovation Center, Rogers Corporation, Burlington, MA, United States*

BQ-06. **RF complex permeability spectra of Ni-Cu-Zn ferrites for wireless power transfer (WPT) under different applied hydraulic pressures and durations.** *P. Lathiya*[1], J. Wang[1] and M. Kreuzer[2] *1. Electrical Engineering, University of South Florida, Tampa, FL, United States; 2. Chemical Engineering, University of South Florida, Tampa, FL, United States*

BQ-07. **Magnetic Properties of Microwave Processed Ferromagnetic Iron Oxide Powders.** *B.Y. Rock*[1], S. Qadri[2] and S.D. Johnson[2] *1. Plasma Physics Division, U.S. Naval Research Laboratory, Washington, DC, United States; 2. Materials Science Division, U.S. Naval Research Laboratory, Washington, DC, United States*

BQ-08. **Synthesis of Giant Hexagonal Single Crystal Hematite Nanoplates: Elaborate Analysis of Microstructure, Size and Static Magnetic Properties.** *J. Liu*[1], F. Chen[1], H. Luo[1], X. Wang[1], Y. Nie[1], Z. Feng[1] and R. Gong[1] *1. School of Optical and Electronics, Huazhong University of Science and Technology, Wuhan, China*

BQ-09. **The Effect of annealing on Magnetic Properties of "Thick" Microwires.** P. Corte-León[1,2], V. Zhukova[1,2], M. Ipatov[1,2], J. Blanco[2], J. Gonzalez[1] and *A. Zhukov*[1,3] *1. Dept. Phys. Mater, University of Basque Country, UPV/EHU, San Sebastian, Spain; 2. Dpto. Física Aplicada, EUPDS, University of Basque Country, UPV/EHU, San Sebastian, Spain; 3. Ikerbasque, Bilbao, Spain*

TUESDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session BR
HARD MAGNETIC MATERIALS: FERRITES AND COMPOSITES (Poster Session)

Arjun Pathak, Chair
Ames Laboratory, USDOE, Iowa State University, Ames, IA, United States

BR-01. **Giant coercivity hexaferrite: effect of Ca^{2+} doping in $Sr_{1-x/12}Ca_{x/12}Fe_{12-x}Al_xO_{19}$ hexaferrite.** *T.P. Poudel*[1], S. Yoon[3], J. Mohapatra[2], D. Neupane[1], D. Guragain[1], P. Liu[2] and S.R. Mishra[1] *1. Department of Physics and Material Science, University of Memphis, Memphis, TN, United States; 2. Department of Physics, University of Texas at Arlington, Arlington, TX, United States; 3. Department of Physics, Gunsan national University, Gunsan, The Republic of Korea*

BR-02. **Promising hard magnetic materials based on (Co, Mn)-doped $BaFe_{12}O_{19}$ hexaferrites.** *N. Tran*[1], Y. Choi[1], T. Phan[1] and B. Lee[1] *1. Department of Physics and Oxide Research Center, Hankuk University of Foreign Studies, Yongsi-si, The Republic of Korea*

BR-03. **Improved Magnetic and Dielectric Properties of Cobalt Substituted M-type Barium Hexaferrite Synthesised by Co-precipitation Method.** *K. Rana*[1], S.S. Thakur[2] and A. Thakur[3] *1. Department of Physics, IEC University, Baddi, India; 2. Department of Physics, Government Degree College, Sarkaghat, Mandi, India; 3. Department of Physics, Amity University, Gurgaon, India*

BR-04. **Withdrawn**

BR-05. **Interfacial exchange coupling driven tunable microwave properties of hard/soft nanocomposite ferrites.** *C. Pahwa*[1] and P. Sharma[1] *1. School of Physics & Materials Science, Thapar Institute of Engineering & Technology, Patiala, India*

BR-06. **Polycrystalline Europium Iron Garnet Films with Perpendicular Magnetic Anisotropy.** *J. Bauer*[1], E.R. Rosenberg[1], B. Song[1] and C. Ross[1] *1. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

BR-07. **New roots for synthesis of Cobalt carbide nanoparticles for rare earth free permanent magnets.** *E. Martinez-Teran*[1] and A.A. El-Gendy[1] *1. Physics, University of Texas-El Paso, El Paso, TX, United States*

BR-08. **Super-Flexible Composite Magnet.** *A. Almansouri*[1], M. Khan[1], A. Alrashoudi[1], L. Swanepoel[2], A. Kaidarova[1], K. Salama[1] and J. Kosel[1] *1. Computer, Electrical and Mathematical Sciences & Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 2. Stellenbosch University, Stellenbosch, South Africa*

TUESDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session BS
VOLTAGE-CONTROLLED MAGNETIC ANISOTROPY AND SWITCHING I (Poster Session)

Jingsheng Chen, Chair
National University of Singapore, Singapore, Singapore

BS-01. **Enhancement of voltage-controlled magnetic anisotropy by Ir doing in Co-based Heusler alloys.** *M. Tsujikawa*[1,2] and M. Shirai[1,2] *1. Research Institute of Electrical Communication, Tohoku Univ., Sendai, Japan; 2. Center for Spintonics Research Network, Tohoku Univ., Sendai, Japan*

BS-02. **Large Room Temperature VCMA in Co\Pt Bilayers Deposited on ALD-grown $SrTiO_3$: the Impact of the Interface.** *B.F. Vermeulen*[1,2], J. Swerts[2], S. Couet[2], M.I. Popovici[2], I.P. Radu[2], P.J. Roussel[2], K. Temst[1], G. Groeseneken[3,2] and K.M. Martens[1,2] *1. Department of Physics and Astronomy, KULeuven, Leuven, Belgium; 2. imec, Leuven, Belgium; 3. Department of Electrical Engineering, KULeuven, Leuven, Belgium*

BS-03. **Voltage Control of Interfacial Magnetism for Flexible Spintronics.** *Z. Zhou*[1] and M. Liu[1] *1. School of Electronic and Information Engineering, Xi'an Jiaotong University, Xi'an, China*

BS-04. **Electric Field Effect on Propagating Spin Wave in YIG Thin Films.** *S. Kasukawa*[1], Y. Shiota[1], T. Moriyama[1] and T. Ono[1] *1. Science, Kyoto University, Uji City, Japan*

BS-05. **Electric field control of magnetic phase transition by means of Li^+ migration in FeRh thin film.** *Y. Xie*[1], B. Wang[1], H. Yang[1] and R. Li[1] *1. Ningbo Institute of Industrial Technology, Chinese Academy of Sciences., Ningbo, China*

BS-06. **Investigation of interfacial Dzyaloshinskii-Moriya interaction under an electric field.** W. Zhang[1], H. Zhong[1], R. Zang[1], Y. Zhang[1] and *S. Kang*[1] *1. Physics, Shandong University, Jinan, China*

BS-07. **Control of Magnetism in Multiferroic Heterostructures by Electric-Field-Induced Ferroelectric Phase Transition.** *C. Feng*[1], Y. Liu[1,2], H. Huang[5], Z. Zhu[3], S. Zhang[4], Y. Yang[5], J. Cai[3], Y. Lu[5] and Y. Zhao[1] *1. Department of Physics and State Key Laboratory of Low-Dimensional Quantum Physics, Tsinghua University, Beijing, China; 2. Key Laboratory of Space Utilization, Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, Beijing, China; 3. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 4. National University of Defense Technology, Beijing, China; 5. University of Science and Technology of China, Heifei, China*

BS-08. **Magneto-optical Light Modulation Using VCMA Effect in MgO/Co-Fe/Gd/Gd-Fe Layers.** *N. Funabashi*[1], R. Higashida[1], K. Aoshima[1] and K. Machida[1] *1. Japan Broadcasting Corporation, Tokyo, Japan*

Session CA
SWITCHING ANTIFERROMAGNETS BY SPIN-ORBIT TORQUES

Chun-Yeol You, Chair
DGIST, Deagu, The Republic of Korea

8:30

CA-01. **From fieldlike torque to antidamping torque in antiferromagnets.** ***(Invited)*** *C. Song*[1], X. Chen[1], X. Zhou[1], R. Zarzuela[2], Y. Tserkovnyak[2], J. Zhang[3], W. Jiang[1] and F. Pan[1] *1. Tsinghua University, Beijing, China; 2. UCLA, Los Angeles, CA, United States; 3. Huazhong University of Science and Technology, Wuhan, China*

9:06

CA-02. **Current polarity-dependent manipulation of antiferromagnetic domains.** ***(Invited)*** *P. Wadley*[1], S. Reimers[1], O. Amin[1], L.X. Barton[1], J. Godinho[2], R.P. Campion[1], V. Novak[2], K. Olejnik[2], J. Wunderlich[2,3], K. Edmonds[1], B.L. Gallagher[1] and T. Jungwirth[2,1] *1. School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom; 2. Nanospintronics, Institute of Physics ASCR, Prague, Czechia; 3. Spintronics, Hitachi Labs Cambridge, Cambridge, United Kingdom*

9:42

CA-03. **Magnetization control and detection of antiferromagnetic NiO.** ***(Invited)*** *T. Moriyama*[1] *1. Kyoto University, Kyoto, Japan*

10:18

CA-04. **Néel vector manipulation and anisotropic magnetoresistance of Mn_2Au.** ***(Invited)*** *M. Jourdan*[1], S. Bodnar[1], L. Šmejkal[1,2], M. Filianina[1], A. Sapozhnik[1], J. Sinova[1], M. Kläui[1] and H. Elmers[1] *1. Institute of Physics, Mainz University, Mainz, Germany; 2. Institute of Physics, Academy of Science of the Czech Republic, Prague, Czechia*

10:54

CA-05. **Theory of Spin Transport and Torque in Non-Collinear Antiferromagnets.** ***(Invited)*** *A. Manchon*[1,2], P. Ndiaye[1], A. Salimath[1], F. Zhuo[1], D. Goli[1] and A. Abbout[1] *1. Physical Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia; 2. Computer, Electrical and Mathematical Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

Session CB
SPIN-CHARGE CONVERSION AND MATERIALS
Tom Silva, Chair
NIST, Boulder, CO, United States

8:30

CB-01. **Self-consistent determination of spin Hall angle and spin diffusion length in Pt and Pd.** *H. Ding*[1], X. Tao[1], Q. Liu[1], B. Miao[1], R. Yu[1], L. Sun[1], J. Du[1], D. Wu[1], K. Chen[2], S. Zhang[2], Z. Yuan[3] and L. Zhang[3] *1. Department of Physics, Nanjing University, Nanjing, China; 2. Department of Physics, University of Arizona, Tucson, AZ, United States; 3. Department of Physics, Beijing Normal University, Beijing, China*

8:42

CB-02. **Unveiling the mechanisms of the spin Hall effect in Ta.** E. Sagasta[1], Y. Omori[2], S. Velez[1], R. Llopis[1], C. Tollan[1], A. Chuvilin[1,3], L.E. Hueso[1,3], M. Gradhand[4], Y. Otani[2,5] and *F. Casanova*[1,3] *1. CIC nanoGUNE, San Sebastian, Spain; 2. ISSP, University of Tokyo, Kashiwa, Japan; 3. IKERBASQUE, Bilbao, Spain; 4. University of Bristol, Bristol, United Kingdom; 5. RIKEN-CEMS, Wako, Japan*

8:54

CB-03. **Tuning the ISHE-induced electromotive force in a platinum film by ionic gating.** *M. Hokazono*[1], S. Dushenko[1], K. Nakamura[2], Y. Ando[1], T. Shinjo[1] and M. Shiraishi[1] *1. Dep. Electronic Engineering and Science, Kyoto University, Kyoto city, Japan; 2. Dep. of Physics Enginnering, Mie University, Tsu City, Japan*

9:06

CB-04. **Spin-Charge Conversion Induced under Spin Pumping and Ferromagnetic Resonance in CoFeB.** *S. Dushenko*[1,2], G. Kopnov[3], A. Gerber[3], T. Shinjo[1], Y. Ando[1] and M. Shiraishi[1] *1. Department of Electronic Science and Engineering, Kyoto University, Kyoto, Japan; 2. Institute for Research in Electronics and Applied Physics, University of Maryland College Park and CNST National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Faculty of Exact Sciences, Tel Aviv University, Tel Aviv-Yafo, Israel*

9:18

CB-05. **Field- and Current-Driven Domain Wall Motion in Epitaxial Pt/Co/$Pt_{1-x}Au_x$ Trilayers with Controlled Inversion Symmetry Breaking.** K. Shahbazi[1], A. Hrabec[1,2], S. Moretti[3,4], M. Ward[1], T.A. Moore[1], V. Jeudy[5], E. Martinez[3] and *C.H. Marrows*[1] *1. University of Leeds, Leeds, United Kingdom; 2. Paul Scherrer Institute, Villigen, Switzerland; 3. University of Salamanca, Salamanca, Spain; 4. University of Konstanz, Konstanz, Germany; 5. CNRS, Universites Paris-Sud et Paris-Saclay, Orsay, France*

9:30

CB-06. **Effect of Ta-W alloy composition on effective antidamping-like torque efficiency.** *C. In Ho*[1], K. Yong Jin[1], K. Gyu Won[1], K. Taehyun[1] and Y.K. Kim[1] *1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea*

9:42

CB-07. **Magnetic Proximity Effect in Fe_3O_4:Pt Thin Films Above and Below the Metal-Insulator Verwey Transition.** *K. Morrison*[1], C. Cox[1], A. Caruana[2], B. Nicholson[3], A. Mora-Hernandez[3], A. Hindmarch[3], C. Kinane[2], T. Charlton[4] and L. Bouchenoire[5,6] *1. Physics Department, Loughborough University, Loughborough, United Kingdom; 2. ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Harwell Science and Innovation Campus, Oxon, United Kingdom; 3. Department of Physics, Durham University, Durham, United Kingdom; 4. Large scale structures group in the Neutron scattering Division, Oak Ridge National Lab, Oak Ridge, TN, United States; 5. XMaS, European Synchrotron Radiation Facility, Grenoble, France; 6. Department of Physics, University of Liverpool, Liverpool, United Kingdom*

9:54

CB-08. **Spin-Torque Ferromagnetic Resonance in Low-Damping Spinel Ferrite Thin Films.** *P. Li*[1,2], J.J. Wisser[1,2], L.J. Riddiford[1,2], C. Bi[1,3], A. Altman[1,2], S.X. Wang[1,3], S. Emori[4] and Y. Suzuki[1,2] *1. Geballe Laboratory for Advanced Materials, Stanford University, Stanford, CA, United States; 2. Applied Physics, Stanford University, Staford, CA, United States; 3. Materials Science and Engineering, Stanford University, Stanford, CA, United States; 4. Physics, Virginia Tech, Blacksburg, CA, United States*

10:06

CB-09. **Electric-field control of spin accumulation direction in a spin-orbit torque device.** *R. Mishra*[1*], D. Kumar[1], K. Cai[1], X. Qiu[2] and H. Yang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 2. Tongji University, Shanghai, China*

10:18

CB-10. **Static & dynamic coupling in $Co_xZn_{1-x}O$ – Permalloy heterostructures detected by multifrequency ferromagnetic resonance.** *M. Buchner*[1], T. Schaffers[1], B. Henne[1], S. Pile[1], V. Ney[1] and A. Ney[1] *1. Solid State Physics, Johannes Kepler University, Linz, Austria*

10:30

CB-11. **Studying spin-orbit coupling in Heavy-Metal/Ferromagnet/Heavy-Metal heterostructures using X-ray Magnetic Circular Dichroism.** *L. Stuffins*[1], H. Ohldag[2], A.T. N'Diaye[4], E. Wiggins[1], K. Jeon[3], N. Stelmashenko[3], M.G. Blamire[3], K. Morrison[1] and N. Banerjee[1] *1. Loughborough University, Loughborough, United Kingdom; 2. Stanford Synchrotron Radiation Laboratory, California, CA, United States; 3. Cambridge University, Cambridge, United Kingdom; 4. Advanced Light Source, Berkeley, CA, United States*

10:42

CB-12. **Spintronic Properties of $Tb_3Fe_5O_{12}$/Pt and $Eu_3Fe_5O_{12}$/Pt Bilayer Thin Films.** *E.R. Rosenberg*[1], J. Bauer[1], L. Beran[1,2], B. Song[1], C. Avci[1,3], M. Veis[2], G. Beach[1] and C. Ross[1] *1. Massacusetts Institute of Technology, Cambridge, MA, United States; 2. Charles University, Prague, Czechia; 3. ETH Zurich, Zurich, Switzerland*

10:54

CB-13. **Electric Field Control of Spin-Orbit Torques in Perpendicularly Magnetized Thin Films.** *M. Filianina*[1,2], J. Hanke[3,1], K. Lee[1], D. Han[1], Y. Mokrousov[3,1] and M. Kläui[1,2] *1. Johannes Gutenberg University, Mainz, Germany; 2. Graduate School of Excellence Material Science in Mainz, Mainz, Germany; 3. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Jülich and JARA, Jülich, Germany*

11:06

CB-14. **Controlled interdiffusion of Al in ultrathin Ta/Co_2FeAl/MgO heterostructures for enhanced Spin-orbit Torque.** V. Bhardwaj[1], K.M. Chen[2], Y. Tseng[2] and *R. Chatterjee*[1] *1. Physics, IIT Delhi, New Delhi, India; 2. Materials Science & Engineering, National Chiao Tung University, Hsinchu, Taiwan*

11:18

CB-15. **Role of Cu/Al_2O_3 Rashba interface for the highly efficient spin manipulation.** *J. Kim*[2], H. Tsai[3,2], D. Go[1], K. Kondou[2], H. Lee[1] and Y. Otani[3,2] *1. Department of Physics, Pohang University of Science and Technology, Pohang, The Republic of Korea; 2. Center for Emergent Matter Science, RIKEN, Wako, Japan; 3. Institute for Materials Research, University of Tokyo, Kashiwa, Japan*

WEDNESDAY MORNING 8:30 — SALON 1

Session CC
NOVEL APPLICATIONS OF MRAM: NEUROMORPHIC COMPUTING AND CRYOGENIC MEMORY

Graham Rowlands, Chair
Raytheon BBN Technologies, Cambridge, MA, United States

8:30

CC-01. **Magnetic Domain Wall based Synaptic and Activation Function Generators for Neuromorphic Accelerators.** *S.A. Siddiqui*[1], S. Dutta[1], L. Liu[1], C. Ross[1] and M. Baldo[1] *1. Massachusetts Institute of Technology, Cambridge, MA, United States*

8:42

CC-02. Neuromorphic Computing with Domain Wall-Based Three-Terminal Magnetic Tunnel Junctions: Synapse. *O.G. Akinola*[1], E. Kim[1], N. Hassan[2], J.S. Friedman[2] and J.C. Incorvia[1] *1. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States; 2. Electrical and Computer Engineering, University of Texas at Dallas, Dallas, TX, United States*

8:54

CC-03. Neuromorphic Computing with Domain Wall-Based Three-Terminal Magnetic Tunnel Junctions: Neurons. *N. Hassan*[1], X. Hu[1], L. Jiang-Wei[2], W.H. Brigner[1], O.G. Akinola[3], F. Garcia-Sanchez[4], M. Pasquale[4], C.H. Bennett[5], J.C. Incorvia[3] and J.S. Friedman[1] *1. Electrical & Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Computer Science, The University of Texas at Dallas, Richardson, TX, United States; 3. Electrical & Computer Engineering, The University of Texas at Austin, Austin, TX, United States; 4. Istituto Nazionale di Ricerca Metrologica, Torino, Italy; 5. Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, Orsay, France*

9:06

CC-04. Implementation of on-chip learning for domain wall and skyrmion based feedforward neural networks using transistor based feedback circuitry that executes back-propagation algorithm. A. Dankar[1], A. Verma[1], D. Kaushik[1], U. Saxena[1], S. Chatterjee[1] and *D. Bhowmik*[1] *1. Deaprtment of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India*

9:18

CC-05. Neural-like computing with stochastic magnetic tunnel junctions. *A. Mizrahi*[1,2], T. Hirtzlin[3], A. Fukushima[4], H. Kubota[4], S. Yuasa[4], M. Stiles[5], J. Grollier[1] and D. Querlioz[3] *1. CNRS / Thales, Palaiseau, France; 2. NIST / University of Maryland, Gaithersburg, MD, United States; 3. Centre de Nanosciences et Nanotechnologies, Orsay, France; 4. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 5. NIST, Gaithersburg, MD, United States*

9:30

CC-06. Ultraefficient neural networks with spiking-mode stochastic MTJs. *M.W. Daniels*[1], A. Mizrahi[2,3], A. Madhavan[3] and M. Stiles[1] *1. NIST, Gaithersburg, MD, United States; 2. CNRS/ Thales Unité Mixte, Paris, France; 3. University of Maryland/ NIST, Gaithersburg, MD, United States*

9:42

CC-07. Energy Efficient Voltage Controlled Nanomagnetic Implementation of Neural Networks. *M. Azam*[1], D. Bhattacharya[1], D. Querlioz[2] and J. Atulasimha[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. University of Paris-Sud, Orsay, France*

9:54

CC-08. **Artificial Spin Ice Inspired Computation using Nanomagnets.** *H. Arava*[1,2], P. Derlet[3], J. Vijayakumar[4], J. Cui[1,2], A. Kleibert[4] and L. Heyderman[1,2] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen, Switzerland; 3. Condensed Matter Theory Group, Paul Scherrer Institute, Villigen, Switzerland; 4. Swiss Light Source, Paul Scherrer Institute, Villigen, Switzerland*

10:06

CC-09. **Magnetic nanocluster-based Josephson junctions for use in neuromorphic computing.** *M.L. Schneider*[1], C.A. Donnelly[1,2], S.E. Russek[1], B. Baek[1], M. Pufall[1], I.W. Haygood[1], P.F. Hopkins[1] and W. Rippard[1] *1. NIST, Boulder, CO, United States; 2. Stanford University, Palo Alto, CA, United States*

10:18

CC-10. **Energy-efficient Josephson Magnetic Random Access Memory.** ***(Invited)*** *A. Herr*[1], I. Dayton[1], E.C. Gingrich[1], Q. Herr[1], M. Loving[1], T. Ambrose[1], D. Miller[1] and R. Burnett[1] *1. Northrop Grumman, Baltimore, MD, United States*

10:54

CC-11. **Prototype cryogenic memory architecture based on 3-terminal SOT-MRAM and superconducting nano-cryotron devices.** *M. Nguyen*[1], G. Rowlands[1], G.J. Ribeill[1], A.P. Wagner[1], L.M. Ranzani[1], M. Gustafsson[1], S.R. Cheng[1], T.A. Ohki[1], S. Shi[2], L. Zhu[2], R. Buhrman[2], E. Toomey[3], M. Colangelo[3], A. Dane[3] and K.K. Berggren[3] *1. Raytheon BBN Technologies, Cambridge, MA, United States; 2. Cornell University, Ithaca, NY, United States; 3. Massachusetts Institute of Technology, Cambridge, MA, United States*

11:06

CC-12. **zLink 3D High Density and High Speed Magnetic Memory.** *J. Zhu*[1] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

11:18

CC-13. **Modeling Magnetization Dynamics Driven by Magneto-electricity.** *S. Rakheja*[1] and N. Kani[2] *1. Electrical and Computer Engineering, New York University, Brooklyn, NY, United States; 2. Reservoir Labs, New York, NY, United States*

Session CD
MULTIFERROICS AND MAGNETOELECTRIC PHENOMENA I
Nian Sun, Chair
Northeastern University, Boston, MA, United States

8:30

CD-01. **Strain-mediated Ferroelectricity and Ferromagnetism in $BiFeO_3$-$CoFe_2O_4$ Nanocomposite.** *S. Ning*[1], G. Tian[1], S. Ojha[1] and C. Ross[1] *1. Materials Science and Engineering, MIT, Cambridge, MA, United States*

8:42

CD-02. **Magnetoelectric and Photomagnetic behavior in Er^{+3}/Yb^{+3} codoped $BiFeO_3$.** *R. Martinez*[1,2], C. Zuluaga[1], Y. Rosas[1], N. Kumar[1], H. Huhtinen[2] and R. Palai[1] *1. Department of Physics, University of Puerto Rico, San Juan, PR, United States; 2. Department of Physics, University of Turku, Turku, Finland*

8:54

CD-03. **Neutron Investigation of the Magnetic Structures and Phase Transitions in Multiferroic GaV_4S_8.** *J.W. Lynn*[1], W.D. Ratcliff[1], M. Bleuel[1,4], L. Zhang[3] and S. Cheong[2] *1. NCNR, NIST, Gaithersburg, MD, United States; 2. Department of Physics, Rutgers University, Piscataway, NJ, United States; 3. Max Planck POSTECH, Pohang University of Science and Technology, Pohang, The Republic of Korea; 4. Materials Science and Engineering, University of Maryland, College Park, MD, United States*

9:06

CD-04. **Influence of Micron-Scale Strain Distributions on the Electrical Reorientation of Magnetization in a Composite Multiferroic System.** ***(Invited)*** *R. Lo Conte*[1], Z. Xiao[2], C. Chen[3], C.V. Stan[4], J. Gorchon[1,5], A. El-Ghazaly[1], M. Nowakowski[1], H. Sohn[2], A. Pattabi[1], A. Scholl[4], N. Tamura[4], A. Sepulveda[3], G. Carman[3], R. Candler[2,3] and J. Bokor[1,5] *1. EECS, University of California at Berkeley, Berkeley, CA, United States; 2. EE, University of California at Los Angeles, Los Angeles, CA, United States; 3. Mechanical and Aerospace Engineering, University of California at Los Angeles, Los Angeles, CA, United States; 4. ALS, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. Materials Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

9:42

CD-05. **Electric Field Mediated Magnetism in γ'-Fe_4N/PMN-PT(011) Multiferroic Heterostructures.** Z. Lai[1] and *W. Mi*[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

9:54

CD-06. Exploiting growth anisotropy in CoFeB films on PMN-PT substrates for giant non-volatile magnetoelectric effects. *M. Ghidini*[1,2], J. Wang[3], D. Pesquera[3], R. Mansell[3], R. Cowburn[3] and N.D. Mathur[3] *1. University of Parma, Parma, Italy; 2. Diamond Light Source, Didcot, United Kingdom; 3. University of Cambridge, Cambridge, United Kingdom*

10:06

CD-07. Modeling the Effects of Ferroelectric Domain Wall Motion on Magnetic Nano-Islands in Strain-Mediated Heterostructures. *A. Kundu*[1], K. Wetzlar[1], P. Lv[1] and C. Lynch[1] *1. Mechanical and Aerospace Engineering, University of California, Los Angeles, Los Angeles, CA, United States*

10:18

CD-08. Strain and Charge-Mediated Nonvolatile Magneto-Electric Effects in Complex Oxide Heterostructures. *R.V. Chopdekar*[1], E. Arenholz[1] and Y. Takamura[2] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Materials Science and Engineering, University of California-Davis, Davis, CA, United States*

10:30

CD-09. Voltage control of RKKY exchange coupling in magnetoelectric heterostructures. *X. Wang*[1], Q. Yang[2], Z. Zhou[2], M. Liu[2] and N.X. Sun[1] *1. Northeastern University, Boston, MA, United States; 2. Xi'an Jiaotong University, Xi'an, China*

10:42

CD-10. Ferroelectric Control of the Magnetic Anisotropy of an Ultrathin Co\Pt Bilayer. *B.F. Vermeulen*[1,2], J. Swerts[2], S. Couet[2], M. Popovici[2], F. Ciubotaru[2], C. Adelmann[2], I.P. Radu[2], A. Stancu[3], K. Temst[1], G. Groeseneken[4] and K.M. Martens[1,2] *1. Department of Physics and Astronomy, KULeuven, Leuven, Belgium; 2. imec, Leuven, Belgium; 3. Department of Electrical Engineering, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; 4. Department of Electrical Engineering, KULeuven, Leuven, Belgium*

10:54

CD-11. Magnetoelectric Response of Different Shape Metallic Glass/PVDF Laminates Composites. *A. Lasheras*[2], A. Lopes[1], P.G. Saiz[1] and J. Gutierrez[2] *1. BCMaterials, Leioa, Spain; 2. Universidad del País Vasco (UPV/EHU), Leioa, Spain*

11:06

CD-12. Nonvolatile Memory and Synaptic Devices Based on the Magnetoelectric Effects. *Y. Sun*[1], J. Shen[1], K. Zhai[1], D. Shang[1] and Y. Chai[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

11:18

CD-13. **Experimental/Numerical Demonstration/Validation of a Multiferroic Antenna at Low Frequencies.** *J.D. Schneider*[1], J.P. Domann[2], M.K. Panduranga[1], P. Shirazi[1], C. Sennott[3], D. Shahan[3], S. Selvin[3], G. McKnight[3], W. Wall[3], Z. Yao[4], A.C. Chavez[1], Y.E. Wang[4] and G. Carman[1] *1. Mechanical and Aerospace Engineering, University of California Los Angeles, Los Angeles, CA, United States; 2. Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA, United States; 3. HRL Laboratories, Malibu, CA, United States; 4. Electrical and Computer Engineering, University of California Los Angeles, Los Angeles, CA, United States*

WEDNESDAY MORNING 8:30 | VIRGINIA

Session CE
MAGNETO-CALORIC AND MAGNETO-ELASTIC MATERIALS

Franca Albertini, Chair
IMEM-CNR, Parma, Italy

8:30

CE-01. **Wide-band nonreciprocity of coupled surface magneto-acoustic waves propagating in a ferromagnetic bilayer with antiparallel layer magnetizations.** *R.V. Verba*[1], V. Tyberkevych[2] and A.N. Slavin[2] *1. Institute of Magnetism, Kyiv, Ukraine; 2. Department of Physics, Oakland University, Rochester, MI, United States*

8:42

CE-02. **A vector formalism for magneto-elastic interactions in micro- and nano-sized magnetic systems.** *I. Lisenkov*[1] *1. Electrical and Computer Engineering Department, Northeastern University, Boston, MA, United States*

8:54

CE-03. **Single domain magnetoelastic Terfenol-D microdisks for particle and cell manipulation.** *Z. Xiao*[1*], R.I. Khojah[2], M.K. Panduranga[3], M. Goiriena-Goikoetxea[4], R.V. Chopdekar[5], R. Lo Conte[4], J. Bokor[4], G. Carman[3], D. Di Carlo[2] and R. Candler[1,3] *1. Electrical and Computer Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Bioengineering, University of California, Los Angeles, Los Angeles, CA, United States; 3. Mechanical and Aerospace Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 4. Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, CA, United States; 5. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

9:06

CE-04. **Magneto-Caloric Materials for Something Other than Refrigeration: Switchable MRI Labels and Neuro-Stimulation.** ***(Invited)*** *M. Barbic*[1] *1. Janelia Research Campus, Howard Hughes Medical Institute, Ashburn, VA, United States*

9:42

CE-05. **Epitaxial NiMnGa thin films: microstructure and magnetic engineering by post-growth treatments.** M. Takhsha Ghahfarokhi[1], F. Casoli[1], S. Fabbrici[1], L. Nasi[1], R. Cabassi[1], F. Celegato[2], P. Tiberto[2], G. Trevisi[1], G. Bertoni[1] and *F. Albertini*[1] *1. IMEM-CNR, Parma, Italy; 2. INRIM, Torino, Italy*

9:54

CE-06. **Magnetoelastic non-hysteretic first-order phase transition in rare-earth intermetallic Eu_2In.** F. Guillou[1], *A.K. Pathak*[1], D. Paudyal[1], Y. Mudryk[1] and V.K. Pecharsky[1,2] *1. Ames Laboratory, U.S. Department of Energy, Ames, IA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States*

10:06

CE-07. **Investigating the Role of Ga-substitution in $Fe_{1-x}Ga_x$ (Galfenol) Thin Films.** *S. Roy*[1], M. Wang[1], L. Clarke[2], S.A. Cavill[2], K.W. Edmonds[1] and A. Rushforth[1] *1. Physics, University of Nottingham, Nottingham, United Kingdom; 2. Physics, University of York, York, United Kingdom*

10:18

CE-08. **Texture Dependent Surface Energy Measurements on Magnetostrictive Alloys for Abnormal Grain Growth Modeling.** *M.N. Van Order*[1], S. Na[2] and A.B. Flatau[1,2] *1. Materials Science & Engineering, University of Maryland, College Park, MD, United States; 2. Aerospace Engineering, University of Maryland, College Park, MD, United States*

10:30

CE-09. **Aluminum and Gallium additions to Magnetic High Entropy Alloys.** *N.J. Jones*[1], G. Petculescu[2], P.K. Lambert[1] and S. Na[1] *1. Physical Metallurgy and Fire Protection Branch, Naval Surface Warfare Center, Carderock Division, Bethesda, MD, United States; 2. Physics, University of Louisiana at Lafayette, Lafayette, LA, United States*

10:42

CE-10. **The shape memory effect in FeMnSi-based rapidly solidified glass-covered microwires.** H. Chiriac[1], S. Corodeanu[1], M. Grigoras[1], F. Borza[1], V. Dobrea[1] and *N. Lupu*[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

10:54

CE-11. **Magnetostrictive Antiferromagnetic Fe50Mn50 for High Speed Multiferroic Applications.** *P. Shirazi*[2], A. Barra[1], T. Lee[2], M.K. Panduranga[1], S.V. Prikhidko[2] and G. Carman[1] *1. Mechanical and Aerospace Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Materials Science and Engineering, University of California, Los Angeles, Los Angeles, CA, United States*

11:06

CE-12. **Development of a Water Level Sensor using Magnetostrictive Materials.** *J. Yoo*[1], N.J. Jones[1], K. Flynn[2] and R. Jacobs[3] *1. Physical Metallurgy and Fire Protection Branch, Naval Surface Warfare Center, Carderock Division, Bethesda, MD, United States; 2. Mechanical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States; 3. Wastewater Management Branch, Naval Surface Warfare Center, Carderock Division, Bethesda, MD, United States*

11:18

CE-13. **Self-assembling Structure Formation in Low Density Magnetoactive Polymers.** *D. Sindersberger*[1], N. Prem[1] and G. Monkman[1] *1. Mechatronics Research Unit, OTH Regensburg, Regensburg, Germany*

WEDNESDAY MORNING 8:30 — DELAWARE

Session CF
MAGNETIZATION DYNAMICS I
Yayoi Takamura, Chair
University of California - Davis, Davis, CA, United States

8:30

CF-01. **Fast, Nanoscale Addressability of Nitrogen-Vacancy Spins via Coupling to a Dynamic Ferromagnetic Vortex.** ***(Invited)*** *J. Berezovsky*[1], M.S. Wolf[1] and R. Badea[1] *1. Physics, Case Western Reserve University, Cleveland, OH, United States*

9:06

CF-02. **Time Resolved Investigation of Joule Heating Dissipation in Metallic Multilayer Devices.** *K. Litzius*[1,2], S. Kromin[1], J. Zazvorka[1], I. Lemesh[3], P. Bassirian[1], N. Kerber[1], D. Heinze[1], M. Asa[1], J. Nothelfer[1], K. Richter[1], M. Weigand[4], G.A. Schütz[4], G. Beach[3] and M. Kläui[1,2] *1. Institute of Physics, University of Mainz, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 3. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

9:18

CF-03. **Imaging of the dynamics of the current-induced nucleation of a magnetic skyrmion at a point contact.** *S. Finizio*[1], K. Zeissler[2], S. Wintz[1,3], S. Mayr[1], G. Burnell[2], C.H. Marrows[2] and J. Raabe[1] *1. Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland; 2. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 3. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

9:30

CF-04. **Dynamic magnetic behaviour investigation using spatially and time-resolved x-ray detected ferromagnetic resonance.** *S. Pile*[1], T. Schaffers[1], T. Feggeler[2], R. Meckenstock[2], D. Spoddig[2], K.J. Ollefs[2], V. Ney[1], H. Ohldag[3], M. Farle[2], H. Wende[2] and A. Ney[1] *1. Institute of Semiconductor and Solid State Physics, Johannes Kepler University, Linz, Austria; 2. Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Duisburg, Germany; 3. Stanford Synchrotron Radiation Laboratory, SLAC National Accelerator Laboratory, Menlo Park, CA, United States*

9:42

CF-05. **Size Dependence of Magnetization Dynamics in Individual CoFeB Nanodots.** *A.M. Abdelgawad*[1,2], B. Parks[2] and S. Majetich[2] *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physics, Carnegie Mellon University, Pittsburgh, PA, United States*

9:54

CF-06. **Plasmon-Induced Demagnetization and Magnetic Switching in Ni Nanoparticle Arrays.** *F. Freire Fernández*[1], M. Kataja[1,2], J. Witteveen[1], T. Hakala[1], P. Törmä[1] and S. van Dijken[1] *1. Deparment of Applied Physics, Aalto University, Espoo, Finland; 2. Institut de Ciència de Materials de Barcelona, Barcelona, Spain*

10:06

CF-07. **Dynamics of Magnetization Reversal in Magnetic Insulators Induced by Spin-Orbit Torque.** *W. Hsu*[1] and R.H. Victora[1] *1. Electrical and Computer Engineering, University of Minnesota - Twin Cities, Minneapolis, MN, United States*

10:18

CF-08. **Enhanced ferromagnetic resonance linewidth in coupled ferromagnetic bilayer samples.** *J. Xu*[1], V. Sluka[1], B. Kardasz[2], M. Pinarbasi[2] and A.D. Kent[1] *1. Department of Physics, New York University, New York, NY, United States; 2. Spin Transfer Technologies, Inc., Fremont, CA, United States*

10:30

CF-09. **Response Speed of Heat-Driven Spin-Torque in a Magnetic Tunnel Junction through Time-Resolved Measurement.** *N. Furuichi*[1], M. Goto[5], E. Tamura[1], H. Kubota[2], K. Yakushiji[2], A. Fukushima[2], S. Yuasa[2], N. Strelkov[3,4], B. Dieny[3], S. Miwa[5] and Y. Suzuki[5,2] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. National Institute of Advance Industrial Science and Technology (AIST), Tsukuba, Japan; 3. CEA, CNRS, Grenoble-INP, INAC-SPINTEC, Univ. Grenoble Alpes, Grenoble, France; 4. Lomonosov Moscow State Univ., Moscow, Russian Federation; 5. Graduate School of Engineering Science, Osaka University & Center for Spintronics Research Network, Toyonaka, Japan*

10:42

CF-10. **Dynamic Magnetization Switching, a Machine Learning Study for Switching Criterion.** *K. Gao*[1,2] *1. Applied Materials Division, Argonne National Laboratory, Argonne, IL, United States; 2. Research and Technology Development, International Business and Technology Service, North Oaks, MN, United States*

10:54

CF-11. **Chaotic dynamics in a nanocontact vortex oscillator system.** *M. Yoo*[1] and J. Kim[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Univ. Paris-Saclay, Palaiseau, France*

11:06

CF-12. **GPU-accelerated Thermal Lifetime Calculations for Atomistic Skyrmion Annihilation Processes.** *P.T. Heistracher*[1], C. Abert[1], F. Bruckner[1] and D. Suess[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria*

11:18

CF-13. **Highly anisotropic propagation of domain walls in in-plane magnetic films.** *X. Zhou*[1,2], N. Vernier[2], G. Agnus[2], S. Eimer[2], X. Zhao[3,2], W. Zhang[4], D. Ravelosona[2] and Y. Zhai[1] *1. School of Physics, Southeast University, 211189 Nanjing, China; 2. Center for Nanoscience and Nanotechnology, Université Paris-Sud & CNRS, UMR 9001, 91400 Orsay, France; 3. Fert Beijing Institute, School of Electronic and Information Engineering, Beihang University, 100191 Beijing, China; 4. Department of Physics, National University of Singapore, 117542 Singapore, Singapore*

Session CG

SOFT MAGNETIC MATERIALS III: AMORPHOUS AND NANOCRYSTALLINE MATERIALS

Rafael Pérez del Real, Co-Chair
ICMM, CSIC, Madrid, Spain
Agustina Asenjo, Co-Chair
ICMM, CSIC, Madrid, Spain

8:30

CG-01. **Nanocrystalline soft magnetic materials from binary alloy precursors with high saturation magnetization.** ***(Invited)*** *K. Suzuki*[1], R.R. Parsons[1], B. Zang[1], K. Onodera[2], H. Kishimoto[2], T. Shoji[2] and A. Kato[2] *1. Department of Materials Science and Engineering, Monash University, Clayton, VIC, Australia; 2. Advanced Material Engineering Div., Toyota Motor Corporation, Susono, Japan*

9:06

CG-02. **Development and Test of Concentration Scaled Particulate Demagnetization and Biased Percolation in Effective Media Theories of Magnetic Composites.** *R.L. Moore*[1] *1. ACL, Georgia Tech Research Institue, Atlanta, GA, United States*

9:18

CG-03. **Multi-parameters Optimization of Magnetic Properties in Microwires for Sensor Application.** *J. Gonzalez*[1], A. Chizhik[1], A. Zhukov[1,2], P. Corte-León[1] and A. Stupakiewicz[3] *1. Universidad del País Vasco UPV/EHU, San Sebastian, Spain; 2. IKERBASQUE, Basque Foundation for Science, San Sebastian, Spain; 3. University of Bialystok, Bialystok, Poland*

9:30

CG-04. **Realization of constant permeability up to more than 3 GHz in high B_s powder cores.** *T. Suzuki*[1,2], P. Sharma[1] and A. Makino[1] *1. New Industry Creation Hatchery Center (NICHe), Tohoku University, Sendai, Japan; 2. ALPS ELECTRIC Co., LTD., Sendai, Japan*

9:42

CG-05. **Aging and Consequences of Ferromagnetic Amorphous $Fe_{75}Si_{10}B_{15}$ Microwires for Advanced Inductive Applications.** *X. Zhang*[1], R. Pérez del Real[2], M. Vázquez[2] and L.H. Lewis[1,3] *1. Department of Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 2. Instituto de Ciencia de Materiales de Madrid (ICMM), CSIC, Madrid, Spain; 3. Department of Chemical Engineering, Northeastern University, Boston, MA, United States*

9:54

CG-06. **Virtual Bound State Elements and their Effects on Magnetic and Electrical Properties of Fe-Ni based Metal Amorphous Nanocomposites.** N. Aronhime[1] and *M.E. McHenry*[1] *1. Carnegie Mellon University, Pittsburgh, PA, United States*

10:06

CG-07. **FeNbBP Type Nanocrystalline Alloy with High Bs of 1.64T Optimized by Sputtered Thin Film Method.** *H. Amano*[1], A. Hasegawa[1], K. Ara[1], K. Horino[1] and H. Matsumoto[1] *1. Material Development Center, TDK Corporation, Ichikawa, Japan*

10:18

CG-08. **FeSiP-based Magneto-Dielectric Composites for High Performance Inductors.** *K. Qian*[1], Q. Li[1], C. Yu[1], A.S. Sokolov[1] and V.G. Harris[1] *1. Electrical Engineering, Northeastern University, Boston, MA, United States*

10:30

CG-09. **Magnetic characterization of 1-µm-thick CoFeB steels with ultra-low loss in MHz frequency ranges for power electronics application.** *Y. Takamura*[1], G. Nguyen[2], Y. Ogawa[1], W. Koganoki[1], K. Tsukada[2], S. Nakagawa[1] and K. Fujisaki[2] *1. Dept. of Electrical and Electronic Eng., Tokyo Institute of Technology, Meguro, Japan; 2. Research Center for Smart Vehicles, and Electromagnetic Energy System Laboratory, Toyota Technological Institute, Nagoya, Japan*

10:42

CG-10. **Lehrer Phase Diagram for Nitriding of Nanocrystalline Iron.** *Y. Jiang*[1,2] and L. Jiang[3] *1. Microelectronics, Jiangnan University, Wuxi, China; 2. Electrical & Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 3. Chemical Engineering, UC Berkeley, Berkeley, CA, United States*

10:54

CG-11. **Magnetic Properties of Fe-Cu Solid Solutions processed by Severe Plastic Deformation.** *M. Stückler*[1], L. Weissitsch[1], S. Wurster[1], H. Krenn[2], P. Knoll[2], P. Felfer[3] and A. Bachmaier[1] *1. Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Leoben, Austria; 2. Institue of Physics, University of Graz, Graz, Austria; 3. Department of Materials Science and Engineering, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany*

11:06

CG-12. **Synthesis of novel FeSiBPCCu alloys with high amorphous forming ability and good soft magnetic properties.** X. Fan[1] and *B. Shen*[1,2] *1. School of Materials Science and Engineering, Southeast University, Nanjing, China; 2. Institute of Massive Amorphous Metal Science, China University of Mining and Technology, Xuzhou, China*

11:18

CG-13. **Structural and Magnetic properties of the homologous series of High Entropy alloys of the type FeCoNi-(MnT_x), (T= B, Al, Ga, In and 0.** *D. Niarchos*[1,2], V. Psycharis[1], A. Kaidatzis[1], E. Devlin[1] and G. Gkouzias[2] *1. INN, NCSR D, Aghia Paraskevi, Greece; 2. R&D, AMEN Technologies, Aghia Paraskevi, Greece*

Session CH

MOTORS: DESIGN AND ANALYSIS II

Narayan Kar, Chair
University of Windsor, Windsor, ON, Canada

8:30

CH-01. **Field Current Control of a Brushless Synchronous Machine using Single Inverter Based Sub-Harmonic Field Excitation.** *G. Sirewal*[1], M. Ayub[1] and B. Kwon[1] *1. Electronic Systems, Hanyang University, Ansan-si, The Republic of Korea*

8:42

CH-02. **A New Hybrid Excited Flux Reversal Arc Permanent Magnet Machine Having Partitioned Stators for Large Telescope Application.** *Z. Pan*[1], S. Fang[1], H. Lin[1], H. Yang[1] and S. Lyu[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

8:54

CH-03. **The Influence of Slot Combination on Performance of Brushless Doubly-Fed Generator with Hybrid Rotor.** *F. Zhang*[1], Y. Song[1], S. Jin[1], C. Gerada[2] and J. Wang[3] *1. Shenyang University of Technology, Shenyang, China; 2. University of Nottingham Ningbo China, Ningbo, China; 3. CSIC Electrical Machinery Science &Technology Corporation, Wuxi, China*

9:06

CH-04. **2D Hybrid Steady-State Magnetic Field Model for Linear Induction Motors.** *S. Aleksandrov*[1], T. Overboom[1] and E.A. Lomonova[1] *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

9:18

CH-05. **A 2.5-D Calculation Method of Magnet Eddy Current Loss for Permanent Magnet Electrical Machines.** *S. Xue*[1], Z. Zhu[1], A. Duke[2], Z. Azar[2], R. Clark[2], A. Thomas[2], G. Li[1], M. Odavic[1], A. Griffo[1], M. Foster[1] and D. Stone[1] *1. University of Sheffield, Sheffield, United Kingdom; 2. Siemens-Gamesa Wind Power, Sheffield, United Kingdom*

9:30

CH-06. **Quantitative Comparison of Distinct Dual-Stator Permanent Magnet Vernier Machines for Direct-Drive Applications.** *Z. Song*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Kowloon, Hong Kong*

9:42

CH-07. **Development of a High Performance Axial Flux PM Machine with SMC Cores for Electric Vehicle Application.** *J. Lu*[1,2], Y. Wang[1,2], C. Liu[1,2], G. Lei[3], Y. Guo[3] and J. Zhu[4] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment (School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province (School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 3. University of Technology Sydney, Sydney, NSW, Australia; 4. University of Sydney, Sydney, NSW, Australia*

9:54

CH-08. **Electromagnetic Performance Analysis for Tubular Flux-Switching Permanent Magnet Motor with Hybrid Cores.** *S. Wang*[1,2], Y. Wang[1,2], C. Liu[1,2], Y. Guo[3] and J. Zhu[4] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment (School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province (School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 3. University of Technology Sydney, Sydney, NSW, Australia; 4. University of Sydney, Sydney, NSW, Australia*

10:06

CH-09. **Lumped-Parameter Magnetic Circuit Based Model of a New Axial Gap Hybrid Excited Flux Switching Permanent Magnet Motor.** *E. Yildiriz*[1], M. Gulec[2] and M. Aydin[2] *1. Electrical and Electronics Engineering, Düzce University, Düzce, Turkey; 2. Mechatronic Engineering, Kocaeli University, Kocaeli, Turkey*

10:18

CH-10. **Modeling and Design of a Novel 3-DOF Magnetic Bearing with Toroidal Radial Control Coil.** *Y. Zhong*[1], L. Wu[1], X. Huang[1] and Y. Fang[1] *1. College of Electrical Engineering, Zhejiang Univerisity, Hangzhou, China*

10:30

CH-11. **A planar generator for a wave energy converter.** *M. Trapanese*[1], V. Franzitta[1], D. Curto[1], X. Wang[2], Z. Liu[2] and L. McNabb[2] *1. DEIM, Palermo University, Palermo, Italy; 2. School of Engineering, RMIT, Melbourne, VIC, Australia*

10:42

CH-12. **The innovative electric motor design with 3D airgap.** *W. Peng*[1], Y. Yang[1], H. Yang[1] and C. Lin[1] *1. Industrial Technology Research Institute, Hsinchu, Taiwan*

10:54

CH-13. **Novel Efficiency-shifting Radial-Axial Hybrid Interior Permanent Magnet Synchronous Motor for Electric Vehicle.** *H. Won*[1], Y. Hong[1], W. Lee[1] and M. Choi[1] *1. Department of Electrical and Computer Engineering and MINT Center, The University of Alabama, Tuscaloosa, AL, United States*

11:06

CH-14. **Design of Magnetic Circuit for Improving Output of Magnetostrictive Vibration Power Generator.** *Y. Takenaka*[1] and T. Ueno[1] *1. Kanazawa University, Kanazawa, Japan*

WEDNESDAY MORNING 8:30 | WASHINGTON 5

Session CI
RARE-EARTH INTERMETALLICS AND COMPOUNDS III

Baozhi Cui, Chair
Ames Laboratory, US DOE, Ames, IA, United States

8:30

CI-01. **New Approaches for Fabrication of Highly Coercive Net Shape Magnets.** *A. Baker*[1], S. Baker[1], M. Worthington[1], J. Lee[1], C. Orme[1], J. Kuntz[1] and S.K. McCall[1] *1. Lawrence Livermore National Laboratory, Livermore, CA, United States*

8:42

CI-02. **Laser Beam Melting process applied to NdFeB permanent magnets.** M. Opprecht[1], *S. Luca*[1], S. Cayre[1], G. Gaillard[1], C. Rado[1] and G. Delette[1] *1. CEA-LITEN, Grenoble, France*

8:54

CI-03. **Control of crystalline orientation of hot forged Nd-Fe-B magnet.** *O. Yamashita*[1], D. Ichigozaki[1], D. Kobuchi[1] and T. Shoji[1] *1. Toyota Motor Corporation, Toyota, Japan*

9:06

CI-04. **Magnetic Anisotropy and Crystallographic Alignment in Fe and NdH_2 during *d*-HDDR Process of Nd-Fe-B-Ga-Nb Powders.** *T. Horikawa*[1], M. Yamazaki[1], C. Mishima[1], M. Matsuura[2] and S. Sugimoto[2] *1. Aichi Steel Corporation, Tokai, Japan; 2. Tohoku University, Sendai, Japan*

9:18

CI-05. **Application of high-pressure torsion to Nd-Fe-B nanocomposite magnets.** *A. Hosokawa*[1], K. Takagi[1] and K. Ozaki[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology, Nagoya, Japan*

9:30

CI-06. **Spark Plasma Sintering of Jet-Milled NdFeB Powders with Low Rare Earth Contents.** *L.M. Scherf*[1], R. Kessler[1], T. Tomše[2], J. Jaćimović[1], L. Herrmann[1], J. Dubois[2,3] and S. Kobe[2] *1. Corporate Research, ABB, Baden-Dättwil, Switzerland; 2. Department for Nanostructured Materials, Jozef Stefan Institut, Ljubljana, Slovenia; 3. Institut Jean Lamour, CNRS, Université de Lorraine, Nancy, France*

9:42

CI-07. **Coating low-oxygen $Sm_2Fe_{17}N_3$ magnet powders with nonmagnetic metal elements by using DC magnetron sputtering method.** *W. Yamaguchi*[1], R. Soda[1] and K. Takagi[1] *1. MagMet, AIST, Nagoya, Japan*

9:54

CI-08. **Magnetic properties of Mg-assisted flux grown single crystalline $Sm_2Fe_{17}N_3$.** *T.N. Lamichhane*[1,2], V. Taufour[2,3], A. Palasyuk[2], Q. Lin[2], T. Pandey[4], D. Parker[4], S.L. Bud'ko[1,2] and P.C. Canfield[1,2] *1. Physics and Astronomy, Iowa State University, Ames, IA, United States; 2. Ames Laboratory, Ames, IA, United States; 3. Physics, University of California Davis, Davis, CA, United States; 4. Oak Ridge National Laboratory, Oak Ridge, TN, United States*

10:06

CI-09. **Tough heterogeneous Sm-Co sintered magnets with improved flexural strength.** *B. Cui*[1], G. Ouyang[1,2] and J. Cui[1,2] *1. Ames Laboratory, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, AMES, IA, United States*

10:18

CI-10. **Anisotropic $Ce(CoFeCu)_5$ as Gap Magnet Material.** *K. Gandha*[1], R.P. Chaudhary[1], F. Meng[1,2], M.J. Kramer[2], R. Ott[1,2] and C.I. Nlebedim[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States; 2. Division of Materials Science and Engineering, Ames Laboratory, Ames, IA, United States*

10:30

CI-11. **Crystalline and Magnetic Properties of Rare-Earth Doped $(Sm_{1-x-y}Re_xZr_y)(Fe_{0.8}Co_{0.2})_{11}Ti$ with $ThMn_{12}$ structure.** *J. Lim*[1], H. Qian[1], J. Park[1] and C. Choi[1] *1. Powder & Ceramic Division, Korea Institute of Materials Science, Changwon, The Republic of Korea*

10:42

CI-12. **Inter-Sublattice Exchange Interaction in $Nd(Fe,Ti)_{12}$ Permanent Magnets.** *S.C. Westmoreland*[1], C. Skelland[2], R.F. Evans[1], T.A. Ostler[7], M. Yano[3], T. Shoji[3], A. Manabe[3], A. Kato[3], M. Ito[3], M. Winklhofer[4], G. Zimanyi[5], J. Fischbacher[6], T. Schrefl[6], R.W. Chantrell[1] and G. Hrkac[2] *1. Department of Physics, University of York, York, United Kingdom; 2. College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, United Kingdom; 3. Toyota Motor Corporation, Toyota 471-8572, Japan; 4. Department of Biology and Environmental Sciences, University of Duisburg, Duisburg, Germany; 5. Department of Physics, University of California, Davis, CA, United States; 6. Center for Integrated Sensor Systems, Danube University Krems, Wiener Neustadt, Austria; 7. Faculty of Arts, Computing, Engineering and Sciences, Sheffield Hallam University, Sheffield, United Kingdom*

10:54

CI-13. **Synthesis of Nd-Fe-B/Fe Hybrid Micro-magnets.** *F. Mert*[1], N. Gündüz Akdoğan[2], I.B. Misirliglu[3,4] and O. Akdogan[1] *1. Department of Mechatronics Engineering, Bahçesehir University, Istanbul, Turkey; 2. Faculty of Engineering, Piri Reis University, Istanbul, Turkey; 3. Deparment of Materials Science and Engineering, Sabanci University, Istanbul, Turkey; 4. Nanotechnology Application Center, Sabanci University, Istanbul, Turkey*

WEDNESDAY MORNING 9:30 EXHIBIT HALL A

Session CJ

MOTORS: MODELING AND SIMULATIONS II (Poster Session)

Chunhua Liu, Chair
City University of Hong Kong, Kowloon, Hong Kong

CJ-01. **Design of BLDC coreless PM motor using 3-D printing technology.** *D. Jung*[1], J. Lee[1], J. Lim[1] and J. Kim[1] *1. Hanyang University, Seoul, The Republic of Korea*

CJ-02. **Effect of Pole Ratio on the Performance of Dual Airgap Spoke Type Permanent Magnet Vernier Machine.** *M.R. Siddiqi*[1] and J. Hur[1] *1. Department of Electrical Engineering, Incheon National University, Incheon, The Republic of Korea*

CJ-03. **Comparative Analysis of Parallel Hybrid Magnet Memory Machines with Different PM Arrangements.** H. Yang[1], *H. Zheng*[1], H. Lin[1], Z. Zhu[2], S. Lyu[1] and Z. Pan[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

CJ-04. **Leakage Flux of the Trans-Rotary Magnetic Gear.** *K.N. Jenney*[1] and S. Pakdelian[1] *1. Electrical and Computer Engineering, University of Massachusetts Lowell, Lowell, MA, United States*

CJ-05. **Iron Nitride Magnet Based Permanent Magnet Linear Generator for Oceanic Wave Energy Conversion.** S. Molla[1], *O. Farrok*[1], M. Islam[2] and K.M. Muttaqi[2] *1. Department of Electrical and Electronic Engineering, Ahsanullah University of Science & Technology, Dhaka, Bangladesh; 2. Faculty of Engineering and Information Sciences, University of Wollongong, Wollongong, NSW, Australia*

CJ-06. **Electromagnetic-Thermal Coupled Analysis of Electric Machines Considering Electromagnetic Losses Formed by Inverter Switching Harmonics.** *B. Son*[1], H. Jung[2], D. Lee[3], Y. Kim[4] and S. Jung[1] *1. Sungkyunkwan University, Suwon, The Republic of Korea; 2. Katech, Cheonan, The Republic of Korea; 3. University of Illinois, Urbana, IL, United States; 4. Chosun University, Gwangju, The Republic of Korea*

CJ-07. **Analytical Calculation of Performance for Electro-dynamic wheel with a Ladder-Slit Guideway.** *Y. Ma*[1] and W. Qin[1] *1. School of Electrical Engineering, Beijing Jiaotong University, Beijing, China*

CJ-08. **Improvement Method of Productivity and Field Weakening Control in Surface-Mounted Permanent Magnet Synchronous Motor.** *S. Kang*[1], Y. Ko[1], M. Seo[1], W. Han[1], Y. Kim[2] and S. Jung[1] *1. Sungkyunkwan University, Suwon, The Republic of Korea; 2. Chosun University, Gwangju, The Republic of Korea*

CJ-09. **Analytical Calculation of Air-Gap Magnetic Field in Dual-Stator Brushless Double-Fed Machine.** H. Liu[1], G. Liu[1], *F. Zhang*[1], S. Jin[1], H. Zhang[2] and C. Gerada[2,3] *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China; 2. University of Nottingham, Ningbo, China; 3. University of Nottingham, Nottingham, United Kingdom*

WEDNESDAY MORNING 9:30 — EXHIBIT HALL A

Session CK
MOTORS: MODELING AND SIMULATIONS III (Poster Session)

Shuangxia Niu, Chair
The Hong Kong Polytechnic University, Hong Kong, China

CK-01. **Short-circuit fault analysis of a five-phase fault-tolerant permanent-magnet synchronous machine.** *Y. Sui*[1], P. Zheng[1], L. Cheng[1] and Z. Yin[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

CK-02. **Analytical and Experimental Study of Electromagnetic Loss and Temperature Rise in Induction Machine.** *K. Shin*[1], H. Cho[2] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. Electric, Electronic and Comm. Eng. Edu., Chungnam National University, Daejeon, The Republic of Korea*

CK-03. **Multi-objective Robust Optimization for a Dual-Flux-Modulator Coaxial Magnetic Gear.** *X. Liu*[1], Y. Zhao[1], Z. Chen[2], D. Luo[1] and S. Huang[1] *1. Hunan University, Changsha, China; 2. Aalborg University, Aalborg, Denmark*

CK-04. **Analysis and Design of Surface-Mounted Permanent Magnet Motor Using a Novel Magnetic Equivalent Circuit Taking into Account Magnetic Saturation.** J. Lee[1], T. Kim[2], H. Jung[1] and *J. Ro*[3] *1. Department of Electrical and Computer Engineering, Seoul National University, Seoul, The Republic of Korea; 2. Intelligent Robotics Research Center, Korea Electronics Technology Institute (KETI), Bucheon, The Republic of Korea; 3. School of Electrical and Electronics Engineering, Chung-Ang University, Seoul, The Republic of Korea*

CK-05. **Influences of Stator Teeth Number on PM Coupling Levels of Co-Axial Dual-Mechanical-Port Flux-Switching PM Machines.** L. Zhou[1] and *W. Hua*[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

CK-06. **A Study on the IE4 Class Line-Start SynRM Design Using Kw-Map.** *J. Lee*[1], D. Jung[1], J. Lim[1] and J. Kim[1] *1. Hanyang University, Seoul, The Republic of Korea*

CK-07. **The Influence of Winding Location in Flux-Switching Permanent-Magnet Machines.** *H. Zhang*[1] and W. Hua[1] *1. Southeast University, Nanjing, China*

CK-08. **Rotor Flux-Barriers Designs of Iron Loss Reduction in a Multi-layered IPM Machine for EV Applications.** *M. Sheng*[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

CK-09. **Comparison of Unbalanced Force of BLDC Motor Considering the Number of Parallel Circuits, Y-and Δ-Connection.** *H. Lee*[1], T. Bang[1], J. Choi[1], K. Shin[1] and S. Cho[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*

CK-10. **High performance ferrite permanent magnet brushless machines.** A.K. Shanshal[1], K. Hoang[1] and *K. Atallah*[1] *1. Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

WEDNESDAY
MORNING
9:30

EXHIBIT HALL A

Session CL
SOFT MAGNETIC COMPONENTS: ENERGY HARVESTING AND ACOUSTICS (Poster Session)

Julia Zhang, Chair
Ohio State University, Columbus, OH, United States

CL-01. **Impulse magnetised magnetic screws.** H.M. Mohamed[1] and *K. Atallah*[1] *1. Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

CL-02. **Vibration-type energy harvester for wide frequency range using a Wiegand wire.** *H. Hoshiyama*[1], T. Yamada[1] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

CL-03. **A Helical Magnetic Millirobot with Object Delivery and Collect Mechanism Actuated by a Precession Rotating Magnetic Field.** *H. Lee*[1], S. Lee[1], H. Cho[1], B. Kim[1] and S. Jeon[1] *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

CL-04. **Design of Lower Vibration Magnetically Controlled Reactor.** *T. Ben*[1], L. Chen[1], R. Yan[2], Q. Yang[2], Y. Huang[1], Z. Li[1] and S. Cheng[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

CL-05. **Single Domain Nanoparticle All-Magnetic Flux Transistor.** M. Barbic[2], R. Smith[2], V. Provenzano[3] and *H. ElBidweihy*[1] *1. Electrical and Computer Engineering Department, United States Naval Academy, Annapolis, MD, United States; 2. Applied Physics and Instrumentation Group, Howard Hughes Medical Institute - Janelia Research Campus, Ashburn, VA, United States; 3. National Institute of Standards and Technology, Gaithersburg, MD, United States*

CL-06. **A Signal Generator Utilizing Magnetoelectric Laminate With Quartz Resonator.** *J. Zhang*[1], D. Chen[1], Q. Zhang[1], L. Jiang[1], X. Hang[1], K. Li[1], W. Zhu[1] and L. Cao[1] *1. Zhengzhou University of Light Industry, Zhengzhou, China*

CL-07. **A New Simulation Method for Magnetic Devices with Nonlinear Oscillation.** *Z. Wang*[1], J. Hu[1], G. Zhao[1], Y. Ouyang[1], J. He[1] and S.X. Wang[2,1] *1. Electrical Engineering, Tsinghua University, Beijing, China; 2. Center for Magnetic Nanotechnology, Stanford University, Palo Alto, CA, United States*

CL-08. **1D and 2D Magnetostrictive Actuators.** *Y. Park*[1], M.D. Noh[1] and S. Park[1] *1. Mechatronics Engineering, Chungnam National University, Daejeon, The Republic of Korea*

CL-09. **Dual Magnet Assembly for Enhanced Region of Detection in Portable NMR Applications.** N. Prabhu Gaunkar[1], T. Day[1], M. Mina[1,2] and *D.C. Jiles*[1] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Industrial Design, Iowa State University, Ames, IA, United States*

CL-10. **Magnetostrictive Energy Harvesting.** G. Backman[1], B.F. Lawton[1] and *N. Morley*[1] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom*

WEDNESDAY
MORNING
9:30

EXHIBIT HALL A

Session CM
HIGH FREQUENCY AND MAGNETOELASTIC EFFECTS FOR SENSOR DESIGN II (Poster Session)

Hariharan Nhalil, Chair
Bar-Ilan University, Ramat-Gan, Israel

CM-01. **Magnetostrictive sensors for composite damage.** W.R. Holmes[1], J. Clarke[1], A.S. Padki[1], Z. Leong[1] and *N. Morley*[1] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom*

CM-02. **A new type of highly sensitive inductive sensor integrating soft ferromagnetic wire with ribbon.** *V. Ortiz-Jimenez*[1], T. Eggers[1], O. Thiabgoh[1] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States*

CM-03. **Broadband microwave absorption of composite honeycomb sandwich structures based on magnetic absorbers.** W. Gong[1], H. Luo[1], *X. Wang*[1] and R. Gong[1] *1. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*

CM-04. **Numerical analysis of surface wave attenuation of two-layer microwave absorbing sheet.** *Y. Li*[1], X. Wang[1], D. Li[1] and R. Gong[1] *1. Huazhong University of Science and Technology, Wuhan, China*

CM-05. **Magnetostrictive Tactile Sensor Based on Two-Dimensional Force Detection for Object Recognition.** *B. Zhang*[1,2], B. Wang[1], Y. Li[1] and W. Huang[1] *1. Hebei University of Technology, Tianjin, China; 2. Henan University of Animal Husbandry and Economy, Zhengzhou, China*

CM-06. **Influence of Magnetic Field on Output Characteristics of Piezoresistive Silicon Nanowire Accelerometer.** *R. Yan*[1,2], W. Zhao[1,2], X. Zhang[1,2] and Z. Wu[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

CM-07. **Magnetoelastic Modelling of the ΔE Effect for Sensor Application.** *B. Spetzler*[1], A. Kittmann[1], C. Kirchhof[1], E. Quandt[1] and F. Faupel[1] *1. Kiel University, Kiel, Germany*

CM-08. **Microwave monolithic devices using hard-soft ferrite nanoparticles.** V. Sharma[1] and *B.K. Kuanr*[1] *1. Special Centre for Nanoscience, Jawaharlal Nehru University, Delhi, India*

CM-09. **Three-Axis Micofluxgate with a Fluxguide.** J. Jeng[1], C. Lu[2], H. Ku[3] and *X. Trinh*[1] *1. Department of Mechanical Engineering, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan; 2. Department of Mechanical Engineering, National Taipei University of Technology, Taipei, Taiwan; 3. Graduate Institute of Mechatronics Engineering, National Taipei University of Technology, Taipei, Taiwan*

CM-10. **Field Annealing of Flat Ring and Racetrack Cores for Fluxgate Sensors.** *V. Petrucha*[1] *1. Faculty of Electrical Engineering, Department of Measurement, Czech Technical University in Prague, Prague, Czechia*

Session CN
CRITICAL PHENOMENA, f-ELECTRON MAGNETISM AND ORGANIC MAGNETS
(Poster Session)
Kentaro Kitagawa, Chair
The University of Tokyo, Tokyo, Japan

CN-01. **Investigation of the structural and magnetic phase transition of Ga-doped $Eu_3Ir_4Sn_{13}$.** C. Adriano[1], *R. Grossi*[1], J.C. Souza[1], A.L. Ribeiro[1] and P. Pagliuso[1] *1. Physics, University of Campinas, Campinas, Brazil*

CN-02. **Dilution and Crystal Electric Field Effects on the Intermetallic ($Y_x RE_{1-x}$)Ni_3Ga_9 (RE = Tb, Dy, Ho and Er) Compounds.** E. Mendonça[1], L. Silva[2], C.B. Jesus[1], *J. Duque*[1], D. Garcia[3], J.C. Souza[4] and P. Pagliuso[4] *1. Física, Universidade Federal de Sergipe, São Cristóvão, Brazil; 2. Física, Instituto Federal de Tocantins - IFTO, Colinas do Tocantins, Brazil; 3. CONICET, Centro Atómico Bariloche, Bariloche, Argentina; 4. DEQ, UNICAMP, Campinas, Brazil*

CN-03. **Phase evolution of noncollinear spin textures in $Cr_{1/3}NbS_2$.** *E. Clements*[1], R. Das[2], L. Li[4], V. Keppens[3], D. Mandrus[3], M. Osofsky[5], H. Srikanth[1] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 3. Materials Science and Engineering, University of Tennessee Knoxville, Knoxville, TN, United States; 4. Chemical Sciences, Oak Ridge National Lab, Knoxville, TN, United States; 5. Naval Research Lab, Washington, DC, United States*

CN-04. **Orbiton-Phonon Coupling in Ir^{5+}($5d^4$) Double Perovskite Ba_2YIrO_6.** *B. Singh*[1], G.A. Cansever[2], T. Dey[2], A. Malyuk[2], S. Wurmehl[2,3], B. Büchner[2,3] and P. Kumar[1] *1. School of Basic Sciences, Indian Institute of Technology, Mandi, Mandi, India; 2. Leibniz-Institute for Solid State and Materials Research, (IFW)-Dresden, Dresden, Germany; 3. Institute of Solid State Physics, TU Dresden, Dresden, Germany*

CN-05. **The phenological theory of the metal-insulator phase transition kinetics.** *L. Dubovskii*[1] *1. Theoretical Devision, NRC "Kurchatov Institute", Moscow, Russian Federation*

CN-06. **Effects of Nd doping in Ce*M*In_5 (*M* = Rh and Ir): an NMR study.** *P.E. Menegasso*[1], T. Kissikov[2], Z. Wang[2], N. Curro[2], P. Pagliuso[1] and R.R. Urbano[1] *1. Department of Quantum Eletronics, Unicamp, Campinas, Brazil; 2. Physics Institute, University of California, Davis, CA, United States*

CN-07. **Complex high field phase of the Kondo-lattice $CeRhIn_5$ unveiled by NMR.** G.G. Lesseux[4], H. Sakai[1], Y. Tokunaga[1], S. Kambe[1], P. Kuhns[2], A. Reyes[2], J. Thompson[3], P. Pagliuso[4] and *R.R. Urbano*[4] *1. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 2. NHMFL, Tallahassee, FL, United States; 3. LANL, Los Alamos, NM, United States; 4. Department of Quantum Eletronics, Unicamp, Campinas, Brazil*

CN-08. **Magnetic Molecules Covalently Bound to Carbon Nanotubes for Single Molecule Spin State Detection.** *C. Besson*[1], H. Flötotto[2], R. Frielinghaus[3], A. Hucht[4], P. Kögerler[2], J. König[4], C. Ma[1], J. Maultzsch[5], C. Meyer[6], M. Schnee[3], C.M. Schneider[3], P. Stegmann[4], A. Vierck[7] and Z. Zanolli[8] *1. The George Washington University, Washington, DC, United States; 2. Institute of Inorganic Chemistry, RWTH Aachen University, Aachen, Germany; 3. Peter Gruenberg Institut (PGI-6), Forschungszentrum Juelich, Juelich, Germany; 4. Theoretische Physik, Universität Duisburg-Essen, Duisburg, Germany; 5. Department of Physics, Friedrich-Alexander University Erlangen-Nuernberg, Erlangen, Germany; 6. Fachbereich Physik, Universität Osnabrueck, Osnabrueck, Germany; 7. Institut für Festkörperphysik, Technische Universität Berlin, Berlin, Germany; 8. Institute for Theoretical Solid State Physics, RWTH Aachen University, Aachen, Germany*

CN-09. **Synchrotron radiation spectroscopy study of the spin-state transition in Prussian blue analogue: (Rb,Ba)Mn[Fe(CN)$_6$].** E. Lee[1], S. Seong[1], B. Kim[3], B. Min[3], S. Yusuf[2] and *J. Kang*[1] *1. Physics, The Catholic University of Korea, Bucheon, The Republic of Korea; 2. Solid State Physics, Bhabha Atomic Research Centre, Mumbai, India; 3. Physics, POSTECH, Pohang, The Republic of Korea*

CN-10. **Refinement of synthetic guanine crystals for fast diamagnetic rotation.** A. Mootha[1], K. Suzuki[2], T. Kimura[3], M. Kurahashi[3], H. Asada[3] and *M. Iwasaka*[1] *1. Hiroshima University, Higashihiroshima, Japan; 2. Kanagawa University, Hiratsuka, Japan; 3. Yamaguchi University, Ube, Japan*

WEDNESDAY MORNING 9:30 — EXHIBIT HALL A

Session CO
BIOMATERIALS AND TRANSCRANIAL STIMULATION (Poster Session)

Sahar Jafari, Chair
Weinberg Medical Physics, Inc., Germantown, MD, United States

CO-01. **Magnetically induced flickering change in light-reflecting cuticles of the butterfly Common Bluebottle *Graphium sarpedon*.** *M. Iwasaka*[1], H. Asada[2] and Y. Oba[3] *1. Hiroshima University, Higashihiroshima, Japan; 2. Yamaguchi University, Ube, Japan; 3. Chubu University, Kasugai, Japan*

CO-02. **Three-dimensional magnetic orientation control of ferromagnetic film/guanine crystal hybrid plate.** *T. Sogame*[1], M. Kurahashi[1], E. Muneyama[1], M. Iwasaka[2], K. Kishimoto[1], T. Koyanagi[1] and H. Asada[1] *1. Yamaguchi University, Ube, Japan; 2. Hiroshima University, Higashi-Hiroshima, Japan*

CO-03. **The behavior of monosodium urate crystals as highly viscous suspension modeled synovial fluid.** *Y. Takeuchi*[1], A. Hamasaki[2], M. Iwasaka[3] and M. Matsuda[1] *1. Muroran Institute of Technology, Muroran, Japan; 2. Faculty of Science, Shinshu University, Matsumoto, Japan; 3. RNBS, Hiroshima University, Higashi-Hiroshima, Japan*

CO-04. **Advanced Processing of Bio-Inspired Magnetic Metamaterials.** *E.L. Martin*[1], M.T. Bryan[1], S. Pagliara[2] and F.Y. Ogrin[1] *1. Department of Physics and Astronomy, University of Exeter, Exeter, United Kingdom; 2. Living Systems Institute, University of Exeter, Exeter, United Kingdom*

CO-05. **Control of light reflection angle of guanine crystals by utilizing nonuniform magnetic field.** *K. Deguchi*[1], E. Muneyama[1], M. Iwasaka[2] and H. Asada[1] *1. Yamaguchi University, Ube, Japan; 2. Hiroshima University, Higashi-Hiroshima, Japan*

CO-06. **Effect of Brain Scalp Distance on the Stimulated Brain Volume of Schizophrenia Brain Models During Transcrarnial Magnetic Stimulation.** *E. Cheng*[2], J.R. Germick[3], A. Pandurangi[4], D.C. Jiles[3] and R.L. Hadimani[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 4. Department of Psychiatry, Virginia Commonwealth University, Richmond, VA, United States*

CO-07. **3D Modeling of Diffusion Tensor Imaging Tractography Data for Finite Element Analysis of Transcranial Magnetic Stimulation.** *J. Mak*[1], F. Syeda[2] and R.L. Hadimani[2] *1. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*

CO-08. **The Influence of Magnetic Field Orientation on the Growth of Neurite Extensions of NGF Differentiated PC-12 Neuronal Cells.** *J. Boldrey*[2], L. Que[2], I. Schneider[1] and D.C. Jiles[2] *1. Chemical and Biological Engineering, Iowa State University, Ames, IA, United States; 2. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States*

CO-09. **The Influence of Pulsed Magnetic Fields on the Proliferation of Adherent and Non-Adherent Neuronal Cell Types.** *J. Boldrey*[1], X. Zhong[1], L. Que[1], I. Schneider[2] and D.C. Jiles[1] *1. Electrical and Computer Engineering, Iowas State University, Ames, IA, United States; 2. Chemical and Biological Engineering, Iowa State University, Ames, IA, United States*

CO-10. **New Motor Pathway Model to Study Effect of Transcranial Magnetic Stimulation for Treatment of Parkinson's Disease.** F. Syeda[1], D. Kumbhare[2,3], M.S. Baron[4] and *R.L. Hadimani*[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Department of Neurosurgery, Virginia Commonwealth University, Richmond, VA, United States; 3. McGuire Research Institute, Hunter Holmes McGuire Veterans Affairs Medical Center, Richmond, VA, United States; 4. Southeast Parkinson's Disease Research, Education and Clinical Center, Hunter Holmes McGuire Veterans Affairs Medical Center, Richmond, VA, United States*

WEDNESDAY MORNING 9:30 — EXHIBIT HALL A

Session CP
2D MATERALS AND MAGNETIC SEMICONDUCTORS (Poster Session)

Binod Rai, Chair
Oak Ridge National Lab, Oak Ridge, TN, United States

CP-01. **Growth and Magnetic Properties of Fe_3Se_4 Thin Films.** *Y. Li*[1,2], F. Sun[2], C. Zhao[2], L. Cheng[3], H. Ren[3], G. Miao[3], S. Yang[1] and H. Zeng[2] *1. Xi'an Jiaotong University, Xi'an, China; 2. University at Buffalo, Buffalo, NY, United States; 3. University of Waterloo, Waterloo, ON, Canada*

CP-02. **Electron Spin Resonance Properties of CrI_3 and $CrCl_3$ Single Crystals.** A. Cosio[1], L.M. Martinez[1], C.L. Saiz[1], M. McGuire[2], J. van Tol[3] and *S. Singamaneni*[1] *1. Physics, University of Texas at El Paso, El Paso, TX, United States; 2. Material Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 3. National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, United States*

CP-03. **Magneto-transport properties of $Ga_{0.94}Mn_{0.06}As_{1-x}P_x$ films grown by molecular beam epitaxy.** *S. Dong*[1], X. Li[1], X. Liu[1], S. Bac[1,2], S. Lee[2], M. Dobrowolska[1], R. Zheng[3,4] and J. Furdyna[1] *1. Department of Physics, University of Notre Dame, Notre Dame, IN, United States; 2. Physics Department, Korea University, Seoul, The Republic of Korea; 3. School of Materials Science and Engineering, Nanchang University, Nanchang, China; 4. Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China*

CP-04. **Solvent-less Redox Synthesis of Nanostructured Rare-earth Nitrides: Magnetism, and Opportunities for New Higher-order Nitrides.** *S. Gupta*[1], Y. Mudryk[1] and V.K. Pecharsky[1] *1. Division of Materials Science and enigineerig, Ames Laboratory, Ames, IA, United States*

CP-05. **Static and Dynamic Magnetic Response of Ni doped 3C-SiC.** *G.P. Moharana*[1], S. Singh[2] and H. Narayanan[1] *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. CSIR Innovation Centre For Plasma Processing, Bhubaneswar, India*

CP-06. **Possible Contribution of p-Electrons in the Dirac Cone of Topological Insulator Bi_2Se_3 Probed by Frequency Dependent Electron Spin Resonance.** *J.C. Souza*[1], G.G. Lesseux[2], C. Adriano[1], R.R. Urbano[1], C. Rettori[1,3] and P. Pagliuso[1] *1. IFGW, Unicamp, Campinas, Brazil; 2. 1. Physikalisches Institut, Universitat Stuttgart, Stuttgart, Germany; 3. Natural and Humans Science Center, UFABC, Santo Andre, Brazil*

CP-07. **Anomalous Hall Effect in a Magnetic Topological Insulator $(Bi_{1-x}Mn_x)_2Te_3$.** A. Pilidi[1] and *T. Speliotis*[1] *1. Institute of Nanoscience and Nanotechnology, NCSR Demokritos, Athens, Greece*

CP-08. **Magnetic Properties of Proton Irradiated van der Waals crystals.** *L.M. Martinez*[1], A. Cosio[1], C.L. Saiz[1], Y. Liu[2], C. Petrovic[2], L. Shao[3] and S. Singamaneni[1] *1. Physics, University of Texas at El Paso, El Paso, TX, United States; 2. Condensed Matter Physics and Materials Science, Brookhaven National Laboratory, Upton, NY, United States; 3. Nuclear Engineering, Texas A&M University, College Station, TX, United States*

CP-09. **Strong room temperature ferromagnetism observed in Gd doped ZnO films.** *H. Zhang*[1], J. Wang[3,4], J. Du[3,4] and Q. Xu[2,3] *1. School of Mechanical Engineering, North University of China, Taiyuan, China; 2. School of Physics, Southeast University, Nanjing, China; 3. National Laboratory of Solid State Microstructures, Nanjing University, Nanjing, China; 4. Department of Physics, Nanjing University, Nanjing, China*

CP-10. **High throughput screening for spin gapless semiconductors and thermoelectric materials in quaternary Heusler compounds.** *H. Zhang*[1], Q. Gao[1], T. Lin[1] and I. Opahle[1] *1. Institute of Materials Science, TU Darmstadt, Darmstadt, Germany*

WEDNESDAY MORNING 9:30 — EXHIBIT HALL A

Session CQ

BIT PATTERNED MEDIA & PERPENDICULAR MAGNETIC RECORDING (Poster Session)

Nobuaki Kikuchi, Chair
IMRAM Tohoku University, Sendai, Japan

CQ-01. **Performance evaluation of LDPC coding and iterative decoding system for three-dimensional magnetic recording with dot position fluctuation.** *K. Masuda*[1], Y. Nakamura[1], M. Nishikawa[1] and Y. Okamoto[1] *1. Graduate School of Science and Engineering, Ehime University, Matsuyama, Japan*

CQ-02. **Mitigating the Effects of Track Mis-Registration in Single Reader/Two-Track Reading (SRTR) BPMR Systems.** *C. Warisarn*[1] *1. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand*

CQ-03. **Modified 2D Viterbi Algorithm using 2D Modulation Encoding Constraint in Bit-Patterned Magnetic Recording.** *T. Chumpuwiset*[1], C. Warisarn[1], L.M. Myint[3], S. Koonkarnkhai[2] and P. Kovintavewat[2] *1. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand; 2. Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand; 3. Shinawatra University, Pathum Thani, Thailand*

CQ-04. **Two-Dimensional Magnetic Mesocrystals for Bit Patterned Media.** *S. Guo*[1,2], B. Wang[1] and R. Li[1] *1. Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China; 2. University of Chinese Academy of Sciences, Beijing, China*

CQ-05. **A Study on Iterative Decoding with LLR Modulator Using Neural Network in SMR System.** *M. Nishikawa*[1], Y. Nakamura[1], Y. Okamoto[1], H. Osawa[1] and Y. Kanai[2] *1. Ehime University, Matsuyama, Japan; 2. Niigata Institute of Technology, Kashiwazaki, Japan*

CQ-06. **Multi-Path Concatenated LDPC Coding Scheme for Staggered Bit Patterned Media Recording.** *S. Jeong*[1] and J. Lee[1] *1. Dept. of ICMC Convergence Technology, Soongsil University, Seoul, The Republic of Korea*

CQ-07. **MnGa (001) textured film fabricated on Si substrate for application to ion beam bit patterned media.** T. Ishikawa[1], Y. Miwa[2], *D. Oshima*[3], T. Kato[2] and S. Iwata[3] *1. Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya, Japan; 2. Department of Electronics, Nagoya University, Nagoya, Japan; 3. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*

CQ-08. **A Detection Scheme with Track Mis-Registration Estimation Based on Multi-Layer Perceptrons for Bit Patterned Media Recoding.** *S. Han*[1], G. Kong[1] and S. Choi[1] *1. Yonsei University, Seoul, The Republic of Korea*

CQ-09. **Proposal of granular-type capping layer with high K_u CoPt grains and ferromagnetic oxide grain boundaries for perpendicular magnetic recording media.** *K. Tham*[1], R. Kushibiki[1], T. Kamada[1] and S. Saito[2] *1. Tanaka Kikinzoku Kogyo, Tsukuba, Japan; 2. Tohoku University, Sendai, Japan*

CQ-10. **Perpendicular Exchange Bias in $(Co/Pt)_n$ Multilayers.** K. Elphick[1], *G. Vallejo-Fernandez*[2] and K. O'Grady[2] *1. Electronics Engineering, University of York, York, United Kingdom; 2. Physics, University of York, York, United Kingdom*

Session CR
SPINWAVES
(Poster Session)

Liza Herrera Diez, Co-Chair
CNRS, University of Paris-Sud, Orsay, France
Hans Nembach, Co-Chair
NIST, Boulder, CO, United States

CR-01. **Excitation of Propagating Spin Waves by Nonlocal Spin Injection.** *B. Divinskiy*[1], V.E. Demidov[1], S.O. Demokritov[1] and S. Urazhdin[2] *1. Institute for Applied Physics, University of Muenster, Muenster, Germany; 2. Department of Physics, Emory University, Atlanta, GA, United States*

CR-02. **Withdrawn**

CR-03. **Manipulation of propagating Spin Waves by local magnetic fields.** *Z. Zhang*[1,2], J. Ding[2], M. Jungfleisch[3], Y. Li[2], M. Vogel[2], J. Pearson[2], R. Divan[4], A. Hoffmann[2], Y. Nie[1] and V. Novosad[2] *1. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 4. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States*

CR-04. **Spin-wave modes in Permalloy line and antidot arrays.** A.S. Silva[1], A. Hierro-Rodriguez[2], S. Bunyayev[1], G.N. Kakazei[1], C. Redondo[3], R. Morales[4,5], H. Crespo[1] and *D. Navas*[1] *1. IFIMUP-IN and Department of Physics and Astronomy, Faculdade de Ciências da Universidade do Porto, Porto, Portugal; 2. SUPA, School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 3. Department of Chemical-Physics, University of the Basque Country, Leioa, Spain; 4. Department of Chemical-Physics & BCMaterials, University of the Basque Country & BCMaterials, Leioa, Spain; 5. Ikerbasque, Basque Foundation for Science, Bilbao, Spain*

CR-05. **Local probe of spin wave signal in antidot stripes using micro-focused Brillouin light scattering spectroscopy.** C. Tian[1] and *A. Adeyeye*[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore*

CR-06. **3D FDTD-LLG modelling of magnetisation dynamics in thin film ferromagnetic structures.** *F.Y. Ogrin*[1], T. Manago[2] and S. Grishin[3] *1. University of Exeter, Exeter, United Kingdom; 2. Fukuoka University, Fukuoka, Japan; 3. Saratov State University, Saratov, Russian Federation*

CR-07. **Withdrawn**

CR-08. **Magnonic Spectra of Spin Wave in Antiferromagnetic Skyrmion Crystals.** *F. Ma*[1], X. Jin[1] and Y. Li[1] *1. School of Physics and Technology, Nanjing Normal University, Nanjing, China*

CR-09. **Scattering of Spin Waves on Surfaces of Cylindrical and Spherical Spin Lenses with Inhomogeneous Coupling in Interfaces.** *S. Reshetniak*[1,2] and A. Kutrayeva[1] *1. Faculty of Physics and Mathematics, National Technical University of Ukraine Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine; 2. Institute of Magnetism of NAS and MES of Ukraine, Kyiv, Ukraine*

CR-10. **Scanning Transmission X-Ray Microscopy of Spin Waves in Permalloy.** *F. Gross*[1], N. Traeger[1], M. Weigand[1], G.A. Schütz[1] and J. Gräfe[1] *1. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

WEDNESDAY MORNING 9:30 | EXHIBIT HALL A

Session CS
MAGNETIC SENSORS AND DEVICES (Poster Session)

Matthew Bryan, Chair
University of Exeter, Exeter, United Kingdom

CS-01. **Wireless power transmission for implantable medical devices using a Wiegand pulse in magnetic wires.** *K. Takahashi*[1], T. Yamada[1] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

CS-02. **Visual Event-Related Fields (ERFs) Measurements via Peak to Peak Voltage Detector Type MI Sensor system.** *J. Ma*[1] and T. Uchiyama[1] *1. Graduate School of Engineering, Nagoya University, Nagoya, Japan*

CS-03. **Orientation monitoring of flexible composite magnet for catheter tip localization.** *L. Swanepoel*[1], A. Kaidarova[1], A. Almansouri[1], M. Khan[1] and J. Kosel[1] *1. CEMSE, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

CS-04. **Resonance and contact angle properties of the magnetic-field-controlled droplet.** *C. Li*[1], B. Chen[1], Y. He[1], H. Huang[2] and Z. Wei[2] *1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. NanoEngineering and MicroSystems, National Tsing Hua University, Hsinchu, Taiwan*

CS-05. **Development of a Multi-Modular Helical Magnetic Millirobot with High Stability and Mobility in Narrow and Curved Tubular Environments.** *S. Lee*[1], H. Lee[1], S. Kang[1], K. Lee[1] and S. Jeon[1] *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

CS-06. **Magnetic Self-Assembly and Disassembly of a Multi-Modular Magnetic Millirobot with a Head-to-Tail Chain Structure.** *S. Jeon*[1], H. Lee[1] and S. Lee[1] *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

CS-07. **Iron Oxide and Gold Magneto-Plasmonic Nanoclusters for Biomedical Applications.** *S. Pourmiri*[1], V. Tzitzios[2] and G. Hadjipanayis[1] *1. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 2. Department of Chemical Engineering, Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates*

CS-08. **Investigating the role of coil designs and anatomical variations in cerebellar TMS.** *X. Zhong*[1], P. Rastogi[1], E.G. Lee[2] and D.C. Jiles[1] *1. Department of Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Department of Psychiatry, Massachusetts General Hospital, Charlestown, MA, United States*

WEDNESDAY AFTERNOON 1:30 — SALON 2

Session DA
VOLTAGE-CONTROLLED MAGNETIC ANISOTROPY AND SWITCHING II

Amal El-Ghazaly, Chair
University of California - Berkeley, Berkeley, CA, United States

1:30

DA-01. **Control of Vortex Core Dynamics with Electric Field Induced Strain.** *M. Filianina*[1,2], L. Baldrati[1], T. Hajiri[3], K. Litzius[1,4], L. Aballe[5], M. Foerster[5] and M. Kläui[1,2] *1. Johannes Gutenberg University, Mainz, Germany; 2. Graduate School of Excellence Material Science in Mainz, Mainz, Germany; 3. Department of Materials Physics, Nagoya University, Nagoya, Japan; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. ALBA Synchrotron Light Facility, Barcelona, Spain*

1:42

DA-02. **Spatially Resolved Electric-Field Control of Magnetism in Mesoscopic Multiferroic Heterostructures.** *Y. Ba*[1,8], Y. Liu[1,2], P. Li[1,3], L. Wu[4], J. Unguris[5], D. Pierce[5], D. Yang[6], C. Feng[1,8], Y. Zhang[1,8], H. Wu[7], D. Li[7], Y. Chang[7], J. Zhang[6], X. Han[7], J. Cai[7], C. Nan[4] and Y. Zhao[1,8] *1. Physics, Tsinghua University, Beijing, China; 2. Key Laboratory of Space Utilization, Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, Beijing, China; 3. College of Mechatronics and Automation, National University of Defense Technology, Changsha, China; 4. School of Materials Science and Engineering and State Key Lab of New Ceramics and Fine Processing, Tsinghua University, Beijing, China; 5. Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, MD, United States; 6. Department of Physics, Beijing Normal University, Beijing, China; 7. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Beijing, China; 8. State Key Laboratory of Low-Dimensional Quantum Physics, Tsinghua University, Beijing, China*

1:54

DA-03. **Highly efficient magneto-ionic control of interfacial magnetism using yttria-stabilized zirconia gate oxide.** *S. Jo*[1], J. Park[2], A. Tan[3], H. Ji[2], J. Son[2], G. Beach[3] and S. Woo[1] *1. Center for Spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea; 2. High Temperature Energy Materials Research Center, Korea Institute of Science and Technology, Seoul, The Republic of Korea; 3. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

2:06

DA-04. **Voltage-controlled magnetic anisotropy and voltage-induced Dzyaloshinskii-Moriya interaction change in Fe, Co, Ni and Pd.** *J. Suwardy*[1], K. Nawaoka[1], M. Goto[1,2], Y. Suzuki[1,2] and S. Miwa[1,3] *1. Engineering Science, Osaka University Graduate School, Toyonaka, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 3. The Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan*

2:18

DA-05. **Non volatile ionic control of Dzyaloshinskii Moriya Interaction in Pt/Co/HfO_2.** *L. Herrera Diez*[1], Y. Liu[1], M. Belmeguenai[2], S. Pizzini[3], D.A. Gilbert[4], Y. Roussigné[2], J. Vogel[3], S. Ono[5], J. Langer[6], B. Ocker[6], E. Fullerton[7] and D. Ravelosona[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Orsay, France; 2. Laboratoire des Sciences des Procédés et des Matériaux, Université Paris 13 Nord, Villetaneuse, France; 3. Université Grenoble Alpes, CNRS, Institut Néel, Grenoble, France; 4. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 5. Central Research Institute of Electric Power Industry, Tokyo, Japan; 6. Singulus Technology AG, Kahl am Main, Germany; 7. Center for Magnetic Recording Research, University of California-San Diego, La Jolla, CA, United States*

2:30

DA-06. **Non-volatile ferroelastic switching of an antiferromagnet.** *X. Chen*[1], X. Zhou[1], R. Cheng[2], J. Zhang[3], C. Song[1], Y. Zhao[1] and F. Pan[1] *1. Tsinghua University, Beijing, China; 2. University of California, Riverside, California, CA, United States; 3. Huazhong University of Science and Technology, Wuhan, China*

2:42

DA-07. **A materials design framework for high-performance magnetic memory devices based on experimental element distribution analysis.** *X. Li*[1,2], T. Sasaki[3], C. Grezes[1], D. Wu[4,1], K. Wong[1], C. Bi[5,2], N. Kioussis[6], W. Wang[5], Z. Zhang[4], T. Ohkubo[3], K. Hono[3], P. Khalili[1,7] and K. Wang[1] *1. Electrical and Computer Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Materials Science and Engineering, Stanford University, Stanford, CA, United States; 3. National Institute of Materials Science, Tsukuba, Japan; 4. Optical Science and Engineering, Fudan University, Shanghai, China; 5. Physics, University of Arizona, Tucson, AZ, United States; 6. Physics and Astronomy, California State University Northridge, Northridge, CA, United States; 7. Electrical Engineering and Computer Science, Northwestern University, Evanston, IL, United States*

2:54

DA-08. **Withdrawn**

3:06

DA-09. **Picosecond Electric-Field-Induced Switching of Antiferromagnets.** *V. Lopez*[1], H. Almasi[1] and P. Khalili Amiri[1] *1. Electrical Engineering and Computer Science, Northwestern University, Evanston, IL, United States*

WEDNESDAY
AFTERNOON
1:30

SALON 3

Session DB
ULTRAFAST DYNAMICS
Rajasekhar Medapalli, Chair
University of California - San Diego, La Jolla, CA, United States

1:30

DB-01. **Spin-current-mediated rapid magnon localisation and coalescence after ultrafast optical pumping of ferrimagnetic alloys.** ***(Invited)*** *E. Iacocca*[1,2], T. Liu[3], A. Reid[3], Z. Fu[4], A. Kimel[5], A. Kirilyuk[5], T. Rasing[5], T.A. Ostler[6], R.W. Chantrell[7], M. Hoefer[1], T. Silva[2] and H. Durr[8] *1. Applied Mathematics, University of Colorado, Boulder, CO, United States; 2. NIST, Boulder, CO, United States; 3. SLAC National Accelerator Laboratory, Menlo Park, CA, United States; 4. Tongji University, Shanghai, China; 5. Radboud University, Nijmegen, Netherlands; 6. Sheffiled Hallam University, Sheffield, United Kingdom; 7. University of York, York, United Kingdom; 8. Uppsala University, Uppsala, Sweden*

2:06

DB-02. **Ultrafast domain wall propagation in ferrimagnets by spin-orbit torques.** *K. Cai*[1], R. Mishra[1], L. Ren[1], Z. Zhu[1], G. Liang[1], K.L. Teo[1] and H. Yang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Sinpapore, Singapore*

2:18

DB-03. **Coherent Control of Ultrafast Photo-Magnetic Recording in Iron Garnets.** *K. Szerenos*[1], A. Stupakiewicz[2], A. Kimel[1] and A. Kirilyuk[1] *1. Institute for Molecules and Materials, Radboud University, Nijmegen, Netherlands; 2. Faculty of Physics, University of Bialystok, Bialystok, Poland*

2:30

DB-04. **Time-resolved observation of THz driven magnetic switching in an antiferromagnet.** *S. Schlauderer*[1], C. Lange[1], S. Baierl[1], T. Ebnet[1], A.K. Zvezdin[2,3], A. Kimel[4,5], R. Mikhaylovskiy[4] and R. Huber[1] *1. Physics, University of Regensburg, Regensburg, Germany; 2. Prokhorov General Physics Institute and P.N. Lebedev Physical Institute, Moscow, Russian Federation; 3. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russian Federation; 4. Institute for Molecules and Materials, Radboud University, Nijmegen, Netherlands; 5. Moscow Technological University (MIREA), Moscow, Russian Federation*

2:42

DB-05. **Composition- and magnetic-field-dependent THz emission of spintronic TbFe/Pt layers.** *R. Schneider*[1], M. Fix[2], R. Heming[1], S. Michaelis de Vasconcellos[1], M. Albrecht[2] and R. Bratschitsch[1] *1. Institute of Physics and Center for Nanotechnology, University of Münster, Münster, Germany; 2. Institute of Physics, University of Augsburg, Augsburg, Germany*

2:54

DB-06. **Macromagnetic Simulation of THz signals in antiferromagnetic FeRh by ultrafast thermal pulses.** *M. Menarini*[1], R. Medapalli[1], E. Fullerton[1] and V. Lomakin[1] *1. University of California San Diego, La Jolla, CA, United States*

3:06

DB-07. **The role of Cu_4 spin cluster excitations in photo-induced melting of chiral magnetic order in Cu_2OSeO_3.** *R.B. Versteeg*[1], J. Zhu[1], F. Sekiguchi[1], C. Boguschewski[1], A. Saharasbudhe[1], K. Budzinauskas[1], P. Becker[2] and P.H. van Loosdrecht[1] *1. Institute of Physics II, University of Cologne, Cologne, Germany; 2. Institute of Geology and Mineralogy, Section of Crystallography, University of Cologne, Cologne, Germany*

WEDNESDAY AFTERNOON 1:30 — SALON 1

Session DC
THERMAL SPIN PHYSICS AND MAGNETOTHERMOELECTRIC EFFECTS

Barry Zink, Chair
University of Denver, Denver, CO, United States

1:30

DC-01. **Thermal spin-orbit torque induced by spin Nernst effect in W/CoFeB/MgO structures.** *J. Kim*[1], D. Kim[1] and B. Park[1] *1. KAIST, Daejeon, The Republic of Korea*

1:42

DC-02. **Thermal Excitation Magnonic Spin Current by Light.** *Y. Chen*[1] and S. Huang[1] *1. Physics, National Taiwan University, Taipei, Taiwan*

1:54

DC-03. **Visualization of Surface Spin-Flop Transition in $Y_3Fe_5O_{12}$.** *P. Wu*[1], Y. Chan[2], T. Hung[2], Y. Zhang[2], T. Chuang[2] and S. Huang[1] *1. Physics, National Taiwan University, Taipei, Taiwan; 2. Physics, Academia Sinica, Taipei, Taiwan*

2:06

DC-04. **Spin torque nano-oscillator with tunable perpendicular anisotropy.** *C.J. Safranski*[1], E.A. Montoya[1], A. Smith[1], J. Chen[1] and I. Krivorotov[1] *1. Physics and Astronomy, University of California Irvine, Irvine, CA, United States*

2:18

DC-05. ***Investigation of the Nernst Effect in Magnetically Coupled Co/Au/Fe Multilayer.*** *H. Sharma*[1,2] and M. Mizuguchi[1,2] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. CREST, Japan Science and Technology Agency, Kawaguchi, Japan*

2:30

DC-06. **Thermodynamic Characteristics of Magnons Driven by the Spin-Orbit Torque.** *V.E. Demidov*[1], S. Urazhdin[2], B. Divinskiy[1] and S.O. Demokritov[1] *1. University of Muenster, Muenster, Germany; 2. Emory University, Atlanta, GA, United States*

2:42

DC-07. **Observation of anistropic magneto-Peltier effect.** ***(Invited)*** *K. Uchida*[1] *1. National Institute for Materials Science, Tsukuba, Japan*

WEDNESDAY AFTERNOON 1:30 — MARYLAND

Session DD
NEW COUPLED MAGNETIC PHENOMENA
Don Heiman, Chair
Northeastern University, Boston, MA, United States

1:30

DD-01. **Magnetism and magnetic structures in the NCS compounds ScTGe (T = Mn, Fe).** ***(Invited)*** *A. Provino*[1,2], C. Ritter[3], S.K. Dhar[4] and P. Manfrinetti[1,2] *1. Institute SPIN, CNR, Genova, Italy; 2. Department of Chemistry, University of Genova, Genova, Italy; 3. Institute Laue-Langevin, ILL, Grenoble, France; 4. Department of Condensed Matter Physics & Material Science, TIFR, Mumbai, India*

2:06

DD-02. Withdrawn

2:18

DD-03. Magnon-photon coupling between a superconducting resonator and a thin film permlloy stripe. *Y. Li*[1,2], T. Polakovic[3,4], Y. Wang[2], J. Xu[2,5], S. Lendinez[2], Z. Zhang[2,6], J. Ding[2], T. Khaire[2], H. Saglam[2], R. Divan[7], J. Pearson[2], W. Kwok[2], Z. Xiao[2,5], V. Novosad[2], A. Hoffmann[2] and W. Zhang[1,2] *1. Oakland University, Rochester, MI, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Physics Division, Argonne National Laboratory, Lemont, IL, United States; 4. Drexel University, Philadelphia, PA, United States; 5. North Illinois University, DeKalb, IL, United States; 6. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China; 7. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States*

2:30

DD-04. Chiral surface and edge plasmons in ferromagnetic conductors. *S. Zhang*[1,2] and G. Vignale[2] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Department of Physics and Astronomy, University of Missouri, Columbia, MO, United States*

2:42

DD-05. Influence of seed layers on the location and shape of the 0-π transition in the Fe material system. *N. Siwak*[1], T. Ambrose[1], I. Dayton[1], H.K. Ermer[1], E.C. Gingrich[1], S. Keebaugh[1], M. Loving[1], D. Miller[1], N. Rizzo[1], A. Sidorov[1] and O. Naaman[1] *1. Advanced Concepts & Technologies, Northrop Grumman Corporation, Linthicum, MD, United States*

2:54

DD-06. Withdrawn

3:06

DD-07. Unusual evolution of the magnetism in nanocrystalline $BaCo_{1-x}Mn_xO_{3-\delta}$ ($0 < x < 0.5$). *A. Kumar*[1] and R.N. Mahato[1] *1. School of Physical Sciences, Jawaharlal Nehru University, New Delhi, India*

Session DE
COMPLEX OXIDES
Jeffrey Lynn, Chair
NIST, Gaithersburg, MD, United States

1:30

DE-01. **Magneto-optical Properties of Fe-doped $CuAlO_2$.** *M. Aziziha*[1], R. Beesley[1], S.A. Byard[1,2], J.P. Lewis[1], M.S. Seehra[1] and M.B. Johnson[1] *1. Department of Physics and Astronomy, West Virginia University, Morgantown, WV, United States; 2. Department of Physics, Grove City College, Grove City, PA, United States*

1:42

DE-02. **Kondo effect and spin orbit interaction in $LaTiO_3$/$CeTiO_3$/$SrTiO_3$ heterostructure.** *P. Ghising*[1], D. Das[1], S. Das[1,2] and Z. Hossain[1] *1. Physics, Indian Institute of Technology, Kanpur, Kanpur, India; 2. Physics, Nano-Magnetism Research Center, Institute of Nanotechnology and Advanced Materials, Bar-Ilan University, Ramat-Gan 52900, Israel, Israel*

1:54

DE-03. **Controlling magnetocrystalline anisotropy of ε-Fe_2O_3.** *I. Ahamed*[1], R. Skomski[2] and A. Kashyap[1] *1. School of Basic Sciences, Indian Institute of Technology, Mandi, India; 2. Nebraska Center for Materials and Nanoscience &Department of Physics and Astronomy, University of Nebraska, University of Nebraska, Lincoln, NE, United States*

2:06

DE-04. **Colossal Magnetoresistance in $EuTiO_{3-d}$.** K. Rubi[1] and *R. Mahendiran*[1] *1. Physics, National University of Singapore, Singapore, Singapore*

2:18

DE-05. **Study of magnetic phase transition in $LaCoO_3$ and $La_{0.7}Sr_{0.3}CoO_3$ thin films grown by pulsed laser deposition.** *T. Joshi*[1], D. Belanger[1] and D. Lederman[1] *1. Physics, University of California, Santa Cruz, Santa Cruz, CA, United States*

2:30

DE-06. **Stabilization of $Sr_{0.6}Ba_{0.4}MnO_3$ thin films and modulation in magnetic behaviour.** *R. Rawat*[1], G. Panchal[1], S. Choudhary[1], A. Jana[1], R. Choudhary[1] and D. Phase[1] *1. Department of Condensed Matter Physics, UGC DAE Consortium for Scientific Research, Indore, India*

2:42

DE-07. **Interfacial Ferromagnetism and Exchange Bias in NdNiO3/NdMnO3 Multilayers.** *H. S*[1], M. Chandra[1] and K. Mavani[1] *1. Discipline of Physics, Indian Institute of Technology (IIT) Indore, Simrol, India*

2:54

DE-08. **Interfacial control of chiral magnetism in iridate-manganite superlattices.** *E. Skoropata*[1], J. Nichols[1], A. Rastogi[1], C. Sohn[1], R.D. Desautels[1], X. Gao[1], S. Okamoto[1] and H. Lee[1] *1. Oak Ridge National Laboratory, Oak Ridge, TN, United States*

3:06

DE-09. **Incommensurate Helical Magnetism in Epitaxial $SrFeO_3$ and $CaFeO_3$ Heterostructures.** *P.C. Rogge*[1], R.J. Green[2,3] and S.J. May[1] *1. Materials Science and Engineering, Drexel University, Philadelphia, PA, United States; 2. Stewart Blusson Quantum Matter Institute, University of British Columbia, Vancouver, BC, Canada; 3. Department of Physics and Engineering Physics, University of Saskatchewan, Saskatoon, SK, Canada*

WEDNESDAY AFTERNOON 1:30 — DELAWARE

Session DF
HIGHLY FRUSTRATED MAGNETISM AND SPIN GLASSES I

Bruce Gaulin, Chair
McMaster University, Hamilton, ON, Canada

1:30

DF-01. **Amplitude Mode in the Planar Triangular Antiferromagnet α-$NaMnO_2$. *(Invited)*** *R. Dally*[1,2], Y. Zhao[3,4], Z. Xu[3,4], R. Chisnell[3], M. Stone[5], J.W. Lynn[3], L. Balents[6] and S.D. Wilson[1] *1. Materials Department, University of California, Santa Barbara, Santa Barbara, CA, United States; 2. Physics Department, Boston College, Chestnut Hill, MA, United States; 3. NIST Center for Neutron Research, Gaithersburg, MD, United States; 4. Materials Science and Engineering, University of Maryland, College Park, MD, United States; 5. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 6. Kavli Institute for Theoretical Physics, University of California, Santa Barbara, Santa Barbara, CA, United States*

2:06

DF-02. **Nanoscale Control of Competing Interactions and Geometrical Frustration in a Dipolar Trident Lattice.** A. Farhan[1,2], C.F. Petersen[3], S. Dhuey[1], L. Anghinolfi[4], Q. Qin[3], *M.D. Saccone*[5], S. Velten[1], C. Wuth[1], S. Gliga[6], P. Mellado[7], M. Alava[3], A. Scholl[1] and S. van Dijken[3] *1. Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA, United States; 2. Paul Scherrer Institute, Villigen, Switzerland; 3. Aalto University, Espoo, Finland; 4. Università di Genova, Genova, Italy; 5. University of California Santa Cruz, Santa Cruz, CA, United States; 6. University of Glasgow, Glasgow, United Kingdom; 7. Adolfo Ibáñez University, Santiago, Chile*

2:18

DF-03. **Anomalous nano-magnetic effects in non-collinear spinel chromite $NiCr_2O_4$.** *A. Rathi*[1], P. Babu[2], P. Rout[1], V. Awana[1], R. Pant[1] and G. Basheed[1] *1. CSIR-National Physical Laboratory (NPL), New Delhi, India; 2. UGC-DAE Consortium for Scientific Research, B. A. R. C., Mumbai, India*

2:30

DF-04. **A magnetic study of spin reorientation transition in lanthanum doped $DyFeO_3$.** *C. Reddy*[1], S. Reddy[2], P. Reddy[3] and V. Reddy[4] *1. Physics, Osmania University, Hyderabad, India; 2. Physics, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India; 3. Physics, Osmania University, Hyderabad, India; 4. UGC-DAE Consortium for Scientific Research, Indore, India*

2:42

DF-05. **Tuning magnetic frustration in partially ordered double perovskite: $SrMn_{1-x}W_xO_3$ (x= 0.20 to 0.40).** *P. Yadav*[1], P.J. Baker[2], P. Biswas[2], I.D. Silva[2] and N.P. Lalla[1] *1. LTHM-XRD, UGC-DAE Consortium for Scientific Research, Indore, India; 2. ISIS Facility, Rutherford Appleton Laboratory, Didcot, United Kingdom*

2:54

DF-06. **Spin-freezing Transition in a CoO/Permalloy Bilayer Revealed by Transverse ac Susceptibility.** *W. Li*[1] and S. Urazhdin[1] *1. Physics, Emory University, Atlanta, GA, United States*

3:06

DF-07. **Effect of non J-T active element Fe on structure and magnetic transitions in $GdMn_{1-x}Fe_xO_3$ nanoparticles.** *P. Tiwari*[1] and C. Rath[1] *1. Materials Science, Indian Institute of Technology, Varanasi, India*

WEDNESDAY AFTERNOON 1:30 — WASHINGTON 1

Session DG
INDIVIDUAL NANOPARTICLES AND NANOWIRES
Cristina Gomez-Polo, Chair
Universidad Publica de Navarra, Pamplona, Spain

1:30

DG-01. **Synthesis, Optical and Magnetic Properties of Graphene Quantum Dots and Iron Oxide Nanocomposites.** *M. Sajjad*[1], V. Makarove[2], M. Sultan[2], W. Jadwisienczak[3], B. Weiner[4] and G. Morell[2] *1. Department of Physics and Astronomy, Austin Peay State University, Austin, TN, United States; 2. Department of Physics, University of Puerto Rico, San Juan, PR, United States; 3. School of Electrical Engineering and Computer Science, Ohio University, Athens, OH, United States; 4. Department of Chemistry, University of Puerto Rico, San Juan, PR, United States*

1:42

DG-02. Fabrication, structural and magnetic properties of one-dimensional anti-ferromagnetic FeMn nanostructures. *S.S. Ali*[1,2], W. Li[1], X. Zhang[1], M. Irfan[1], J. Feng[1], K. Javed[3], G. Zhai[4] and X. Han[1] *1. Institute of Physics, University of Chinese Academy of Sciences, Beijing, China; 2. Department of Physics, The University of Lahore, Lahore, Pakistan; 3. Department of Physics, Forman Christian College, Lahore, Pakistan; 4. National Space Science Center, University of Chinese Academy of Sciences, Beijing, China*

1:54

DG-03. From Paramagnetic Iron Glycolate to Ferromagnetic Metal Iron Wires. *T. Gaudisson*[1], M. François[2], S. Ammar[3], J. Greneche[4] and S. Fujieda[5] *1. JSPS International Research Fellow (IMRAM, Tohoku University), Sendai, Japan; 2. Institut Jean Lamour, Université de Lorraine, Nancy, France; 3. ITODYS, Université Paris Diderot, Sorbonne Paris Cité, Paris, France; 4. IMMM, Université du Maine, Le Mans, France; 5. IMRAM, Tohoku University, Sendai, Japan*

2:06

DG-04. Domain Wall Motion in Multi-Stack Co/Ni Cylindrical Nanowires. *H. Mohammed*[1], S. Finizio[2], A. Salimath[1], T.C. Hidalgo[1], J.A. Moreno[1], C. Vogler[3], D. Lago-Cachón[1], J. Raabe[2], A. Manchon[1], D. Suess[3], J. Wang[4], B. Stadler[4] and J. Kosel[1] *1. King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. University of Vienna, Vienna, Austria; 4. University of Minnesota, Minneapolis, MN, United States*

2:18

DG-05. Demonstration of Exchange Coupling in Ni/$CoFe_2O_4$ Nanoparticles. *S.K. McCall*[1], A. Baker[1], J. Han[1], S. Baker[1], C. Orme[1], J. Lee[1], M. Worthington[1] and J. Kuntz[1] *1. Materials Science Division, Lawrence Livermore National Laboratory, Livermore, CA, United States*

2:30

DG-06. Magnetically Coupled Core-shell Nanoparticles: Towards Thermometry and Temperature Control on the Nanoscale. *A.J. Biacchi*[1], G. Cheng[1], T. Moffat[1], W. Tew[1], M.J. Donahue[1], S. Woods[1], C. Dennis[1] and A.R. Hight Walker[1] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States*

2:42

DG-07. Surface spin disorder induced by wet milling in Fe/Fe_xO_y core-shell nanoparticles: the influence of the milling agent. M. Lostun[1], M. Porcescu[1], M. Grigoras[1], G. Ababei[1], G. Stoian[1] and *N. Lupu*[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

2:54

DG-08. **Synthesis of Fe metal nanoparticles employing sugars as reducing agents.** L. Cervera[1,2], M. Monteserín[3], S. Larumbe[3], F. Martín[3], J. Perez-Landazabal[1,2] and *C. Gomez-Polo*[1,2] *1. Departamento de Ciencias, Universidad Publica de Navarra, Pamplona, Spain; 2. INAMAT, Universidad Publica de Navarra, Pamplona, Spain; 3. Surface Engineering, Asociación de la Industria Navarra, Cordovilla, Spain*

3:06

DG-09. **Structure and Magnetism of Cobalt Silicide Nanoparticles.** *B. Balasubramanian*[1,2], R. Pathak[3], R. Pahari[1,2], R. Skomski[1,2], Z. Ahmadi[4], H. Komuro[1,2], A. Kashyap[3], J. Shield[4], G. Hadjipanayis[5] and D.J. Sellmyer[1,2] *1. Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, United States; 2. Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, United States; 3. School of Basic Sciences, Indian Institute of Technology Mandi, Mandi, India; 4. Department of Mechanical and Materials Engineering, University of Nebraska, Lincoln, NE, United States; 5. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States*

WEDNESDAY
AFTERNOON
1:30

WASHINGTON 2

Session DH
ENERGY-ASSISTED MAGNETIC RECORDING AND BIT PATTERNED MEDIA

Shikha Jain, Chair
Western Digital, San Jose, CA, United States

1:30

DH-01. **Skew-aware Joint Multi-track Equalization for Array-reader based Interlaced Magnetic Recording.** S. Yoon[1] and *E. Hwang*[1] *1. School of Mechatronics, Gwangju Institute of Science & Technology, Gwangju, The Republic of Korea*

1:42

DH-02. **Write Head Design for Effective Curvature Reduction in Heat-Assisted Magnetic Recording by Topology Optimization.** *O. Muthsam*[1], F. Bruckner[1], C. Vogler[1] and D. Suess[1] *1. Physics of Functional Materials, University of Vienna, Vienna, Austria*

1:54

DH-03. **Tabu Search Aided Two-dimensional Partial Response Maximum Likelihood Detection Scheme for Bit Patterned Media Recording.** *G. Kong*[1] and S. Choi[1] *1. School of Electrical and Electronic Engineering, Yonsei University, Seoul, The Republic of Korea*

2:06

DH-04. **A Simple 2-Head 2-Track Detection Method for Staggered Bit-Patterned Magnetic Recording.** *P. Kovintavewat*[1], S. Koonkarnkhai[1] and C. Warisarn[2] *1. Data Storage Technology Research Center, Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand; 2. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand*

2:18

DH-05. **Thermal activation effect in microwave assisted switching of CoCrPt granular media.** *N. Kikuchi*[1,2], S. Kikuchi[3], K. Shimada[3], K. Sato[1], S. Okamoto[1,2], O. Kitakami[1,2] and T. Shimatsu[3,4] *1. IMRAM Tohoku University, Sendai, Japan; 2. CSRN Tohoku University, Sendai, Japan; 3. FRIS Tohoku University, Sendai, Japan; 4. RIEC Tohoku University, Sendai, Japan*

2:30

DH-06. **Read Head Problems for 2Tbit/in^2 Hard Disk Drive.** *M. Takagishi*[1] and T. Nagasawa[1] *1. Corporate Research & Development Center, Toshiba Corporation, Kawasaki, Japan*

2:42

DH-07. **Large current spin polarization of polycrystalline $Co_2(Mn_{0.6}Fe_{0.4})Ge$ Heusler alloy films for CPP-GMR devices.** *S. Narayananellore*[1], T. Nakatani[1], Y. Sakuraba[1], K.R. Loku Singgappulige[2], H. Tajiri[2] and K. Hono[1] *1. National Institute for Materials Science, Tsukuba, Japan; 2. Japan Synchrotron Radiation Research Institute, Sayo, Japan*

2:54

DH-08. **Tuning magnetic anisotropy in $(Y_{1-x}Ce_x)Co_{5\pm y}$ thin films grown by molecular beam epitaxy.** *S. Sharma*[1], I.A. Radulov[1], L. Diop[1], P. Komissinskiy[1], M. Major[1], K.P. Skokov[1], O. Gutfleisch[1] and L. Alff[1] *1. Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany*

3:06

DH-09. **Cu_2Sb-type MnGaGe films with perpendicular magnetization.** *M. Sun*[1,2], T. Kubota[1,3], Y. Kawato[4], Y. Sonobe[4] and K. Takanashi[1,3] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. School of Engineering, Tohoku University, Sendai, Japan; 3. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 4. Samsung R&D Institute Japan, Yokohama, Japan*

Session DI

METROLOGY AND SPINTRONIC DEVICES

Ron Goldfarb, Chair
National Institute of Standards and Technology, Boulder, CO, United States

1:30

DI-01. **Electromagnetic Units, the Giorgi System, and the Revised International System of Units.** ***(Invited)*** *R.B. Goldfarb*[1] *1. National Institute of Standards and Technology, Boulder, CO, United States*

2:06

DI-02. **Magnetic Calibration Standards for 3D Magnetometers.** *B.E. Strauss*[1], A.J. Biacchi[2], A.R. Hight Walker[2], R. Shull[1] and C. Dennis[1] *1. Material Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States*

2:18

DI-03. **Characterization and model of soft magnetic materials by magnetic spectroscopy: from Cole-Cole model to fractional high amplitude dynamic hysteresis model.** *B. Ducharne*[1] and B. Zhang[2] *1. LGEF, INSA Lyon, Villeurbanne, France; 2. School of mechanical engineering, Shandong University, Weihai, China*

2:30

DI-04. **Sensitivity of Synchrotron X-ray Diffraction to the Magnetic Anomalies: Low Temperature Study.** *H. Singh*[1,2], M.N. Singh[2], A. Upadhyay[2], A. Sagdeo[2] and A.K. Sinha[2] *1. Stony Brook University, Stony Brook, NY, United States; 2. Indus-2, RRCAT, Indore, India*

2:42

DI-05. **Electromagnetic and Mechanical Characterization of Totally Flexible Coil for Transcranial Magnetic Stimulation.** *M. Liu*[1], P. Tuovinen[1,2], Y. Kawasaki[1], M.A. Yedeas[1], Y. Saitoh[3] and M. Sekino[1,3] *1. Graduate School of Engineering, the University of Tokyo, Tokyo, Japan; 2. Aalto University, Helsinki, Finland; 3. Osaka University, Osaka, Japan*

2:54

DI-06. **Photovoltaic Effect on Magnetic Tunnel Junction Based Molecular Spintronics Devices.** *P. Tyagi*[1,2] and C. Riso[1] *1. Mechanical Engineering, University of the District of Columbia, Washington, DC, United States; 2. Chemical and Materials Engineeing, University of Kentucky, Lexington, KY, United States*

3:06

DI-07. **Spintronic Nano-Neuron: The Role of Non-Linear Data Processing on Speech Recognition in the Framework of Reservoir Computing.** *F. Abreu Araujo*[1], M. Riou[2], J. Torrejon[3] and J. Grollier[2] *1. Institute of Condensed Matter and Nanosciences, Université catholique de Louvain, Louvain-la-Neuve, Belgium; 2. Unité Mixte de Physique CNRS/Thales, Université Paris-Sud, Palaiseau, France; 3. Service de Physique de l'Etat Condensé, CEA Saclay, Gif-sur-Ivette, France*

WEDNESDAY AFTERNOON 1:30 — EXHIBIT HALL A

Session DJ
SPIN CURRENTS AND SPIN-ORBIT TORQUES (Poster Session)

Sergi Lendinez, Co-Chair
Argonne National Laboratory, Lemont, IL, United States
Matthias Benjamin Jungfleisch, Co-Chair
University of Delaware, Newark, DE, United States

DJ-01. **Spin-orbit torque switching of CoFeB/Gd/CoFeB perpendicular layer on sputtered Gd-Bi-Se channel layer.** *J. Chen*[1], P. Sahu[2], DC. Mahendra[2] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States*

DJ-02. **Spin-Orbit Torque Induced Controllable Switching Chirality by Small Voltage.** *M. Yang*[1], Y. Deng[1], Y. Li[1] and K. Wang[1] *1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China*

DJ-03. **Anomalous Spin-orbit Torque Generated by a Ferromagnet in Spin-valve Structure.** *A. Bose*[1,2], D.D. Lam[3], S.S. Bhuktare[1], S. Dutta[1], H. Singh[1], Y. Jibiki[3], M. Goto[3], S. Miwa[3] and A. Tulapurkar[1] *1. Dept. of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India; 2. Dept. of Applied and Engineering Physics, Cornell University, Ithaca, NY, United States; 3. Graduate School of Engineering Science, Osaka University, Osaka, Japan*

DJ-04. **Spin-orbit torques in low-resistive mixed phase Ta.** *A. Kumar*[1], R. Sharma[1], S. Chaudhary[1] and P.K. Muduli[1] *1. Department of Physics, Indian Institute of Technology Delhi, New Delhi, India*

DJ-05. **The current-induced spin-orbit torque from Mo-based magnetic heterostructures.** *T. Chen*[1] and C. Pai[1] *1. Materials Science and Engineering, National Taiwan University, Taipei, Taiwan*

DJ-06. **Investigation of interlayer coupling in field free spin orbit torque structures.** *P. Quarterman*[1], J. Chen[2], J. Wang[2] and J. Borchers[1] *1. NIST, Gaithersburg, MD, United States; 2. University of Minnesota, Minneapolis, MN, United States*

DJ-07. **Multi-level magnetization switching by spin-orbit torques in perpendicular ferromagnetic trilayer structures.** C. Siao[1], *P. Chen*[1], Y. Du[1] and C. Lai[1] *1. National Tsing Hua University, Hsinchu, Taiwan*

DJ-08. **Observation of Spin-Orbit Magnetoresistance in Metal Films on Magnetic Insulators.** L. Zhou[1], H. Song[2], K. Liu[3], Z. Luan[1], P. Wang[1], L. Sun[1], S. Jiang[1], H. Xiang[3], Y. Chen[1], J. Du[1], H. Ding[1], K. Xia[2], J. Xiao[3] and *D. Wu*[1] *1. Nanjing University, Nanjing, China; 2 Beijing Normal University, Beijing, China; 3. Fudan University, Shanghai, China*

DJ-09. **Spin-Orbit Torques in Platinum based Systems.** *J. Nath*[1,2], A. Trifu[1,2], S. Auffret[1,2], I. Joumard[1,2], G. Gaudin[1,2] and I. Miron[1,2] *1. SPINTEC (CEA/CNRS), Grenoble, France; 2. Université Grenoble Alpes, Grenoble, France*

DJ-10. **Room temperature spin-orbit torque switching by topological surface states.** *H. Wu*[1], Y. Xu[2], P. Deng[1], S. Razavi[1], S. Mangin[2] and K. Wang[1] *1. Department of Electrical and Computer Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Institut Jean Lamour, Université de Lorraine, Nancy, France*

DJ-11. **Observing the magnon valve effect in the YIG/Au/YIG structure.** H. Wu[1], C. Fang[1], C. Wan[1], G. Yu[1], J. Feng[1] and *X. Han*[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

DJ-12. **Topological Superconductors in Ferromagnetic Nanowires with Domain Wall.** *M. Ichimura*[1] and M. Hirokawa[2] *1. Hitachi R&D Group, Hatoyama, Japan; 2. Institute of Engineering, Hiroshima University, Higashi-hiroshima, Japan*

WEDNESDAY
AFTERNOON
1:30

EXHIBIT HALL A

Session DK
MAGNETO-CALORIC MATERIALS II (Poster Session)
Jia Yan Law, Chair
Sevilla University, Sevilla, Spain

DK-01. **Magnetic transition and magnetocaloric effect of $Gd_4Sb_{3-x}R_x$ (R=Si, Ge, Sn, $0 \le x \le 0.75$) compounds.** *S. Chen*[1], G. Yao[1], J. Zhang[1], X. Fan[2], X. Yin[2], Z. Chen[3], W. Cui[1,2] and Q. Wang[1] *1. Northeastern University, Shenyang, China; 2. Northwestern Polytechnical University, Shenyang, China; 3. National Institute for Materials Science, Tskuba, Japan*

DK-02. **Investigating the Mechanical and Chemical Stability of $AlFe_2B_2$-Based Compounds for Magnetic Refrigeration.** *X. Zhang*[1], B. Lejeune[2], R. Barua[3], R. McCallum[4] and L.H. Lewis[1,2] *1. Department of Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 2. Department of Chemical Engineering, Northeastern University, Boston, MA, United States; 3. Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 4. McCallum Consulting LLC, Santa Fe, NM, United States*

DK-03. **Ferromagnetic Gd_5Si_4-PVDF composite films for triboelectric energy harvesting applications.** S.M. Harstad[1], P. Zhoa[2], N. Soin[2], A.A. El-Gendy[3], S. Gupta[4], V.K. Pecharsky[4,5] and *R.L. Hadimani*[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Institute of Renewable Energy & Environment Technology, University of Bolton, Bolton, United Kingdom; 3. Physics, University of Texas at El Paso, El Paso, TX, United States; 4. Division of Material Science and Engineering, Ames Laboratory, US Dept. of Energy, Ames, IA, United States; 5. Dept. of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

DK-04. **Addition of Co and the magnetic properties of MnSb.** H. Dara[1] and *G. Markandeyulu*[1] *1. Physics, IIT Madras, Chennai, India*

DK-05. **The effects of Ge occupations and hydrostatic pressure on the metamagnetic phase transition and magnetocaloric effects in Mn_2Sb alloy.** J. Zhang[1], G. Yao[1], S. Chen[1], F. Wei[1], X. Fan[2], X. Yin[2], *Z. Chen*[3], W. Cui[1,2] and Q. Wang[1] *1. Northeastern University, Shenyang, China; 2. Northwestern Polytechnical University, Shenyang, China; 3. National Institute for Materials Science, Tsukuba, Japan*

DK-06. **Structural, magnetic and magnetocaloric properties of $Ni_{43}Mn_{46-x}Fe_xSn_{11}$ (x = 0, 6, 8, 10) alloys.** *H. Qian*[1,2], B.R. Dahal[1], L. Halbritter[1], J. Hu[2], Y. Huh[1] and P.R. Kharel[1] *1. Department of Physics, South Dakota State University, Brookings, SD, United States; 2. Material Science and Engineering, Changzhou University, Changzhou, China*

DK-07. **Effect of Cooling Rate on Magnetocaloric Response of Ni-Mn-Sn Heusler Alloy.** Z. Turgut[1], *M.V. McLeod*[1,2], S. Leonstev[1,2], G. Kozlowski[1,3], T. Bowen[1,4], M. Farfel[1,5] and J. Horwath[1] *1. Air Force Research Laboratory, Wright Patterson Air Force Base, OH, United States; 2. University of Dayton, Dayton, OH, United States; 3. Department of Physics, Wright State University, Dayton, OH, United States; 4. Department of Materials, Penn State University, State College, PA, United States; 5. Department of Materials, Carnegie Mellon University, Pittsburgh, PA, United States*

DK-08. **Powdering and SPS Sintering Effect on The Magnetocaloric Properties of MnNiSi-based Compounds.** *I. Hidayah*[1], H. Zhang[1], Y. Ming[1], Q. Lu[1], D. Zhang[1] and W. Liu[1] *1. Bejing University of Technology, Beijing, China*

DK-09. **Thermomagnetic properties and magnetocaloric effect of non-equiatomic FeCoNiCrAl high-entropy alloys.** *S. Na*[1], P.K. Lambert[1], H. Kim[2], J. Paglione[2] and N.J. Jones[1] *1. Physical Metallurgy and Fire Protection Branch, Naval Surface Warfare Center, Carderock Division, West Bethesda, MD, United States; 2. Center for Nanophysics and Advanced Materials, University of Maryland, College Park, College Park, MD, United States*

DK-10. **An Examination of the Virgin Effect in Mn-Fe-P-Si Alloys via Total Scattering.** N. Fuller[1], M.W. Terban[1], *S.P. Vallone*[2,3], O.L. Baumfeld[4], P. Ko[5], A. Pasko[6], A. Bartok[6], L. Bessais[7], K. Zehani[7], M. LoBue[6], K.G. Sandeman[2,3] and S.J. Billinge[1] *1. Department of Applied Physics and Applied Mathematics, Columbia University, New York, NY, United States; 2. Department of Physics, Brooklyn College of The City University of New York, Brooklyn, NY, United States; 3. Physics Program, The Graduate Center of The City University of New York, New York, NY, United States; 4. Department of Physics, Imperial College London, London, United Kingdom; 5. Cornell High Energy Synchrotron Source, Cornell University, Ithaca, NY, United States; 6. SATIE, ENS Cachan, CNRS, Université Paris-Saclay, Cachan, France; 7. CMTR, ICMPE, CNRS-UPEC, Thiais, France*

DK-11. **Tunable Magneto-Structural Transition and Giant Magneto-Caloric Effect in $MnCoGeC_{0.06}$ Melt Spun Ribbons.** E. Soto-Tovar[1], *C. Sanchez-Valdes*[2], G. Daniel-Pérez[3], R. Varga[4] and J.L. Sanchez Llamazares[5] *1. Instituto de Ingeniería y Tecnología, Universidad Autónoma de Ciudad Juárez, Av. del Charro 450, Ciudad Juárez, Mexico; 2. División Multidisciplinaria, Ciudad Universitaria, Universidad Autónoma de Ciudad Juárez, calle José de Jesús Macías Delgado, Ciudad Juárez, Mexico; 3. Instituto Tecnológico Superior de Irapuato, Irapuato, Mexico; 4. Institute of Physics, Faculty of Sciences, University Pavol Jozef Safárik, Park Angelinum 9, Kosice, Slovakia; 5. Instituto Potosino de Investigación Científica y Tecnológica A.C., Camino a la Presa San José, Col. Lomas 4a sección, San Luis Potosí, Mexico*

WEDNESDAY AFTERNOON 1:30 — EXHIBIT HALL A

Session DL
SOFT MAGNETIC COMPONENTS: TRANSFORMERS AND INDUCTORS I (Poster Session)

Arcady Zhukov, Co-Chair
Basque Foundation for Science, San Sebastian, Spain
Scooter Johnson, Co-Chair
Naval Research Laboratory, Washington, DC, United States

DL-01. **Soft magnetic multilayers for integrated inductors.** *M. Landmann*[1], J. Wrona[2], M. Stenger-Koob[2], R. Salahuddin[3], S. Soh[3], R.P. Singh[3], J. Langer[2] and B. Ocker[4] *1. Product Management, Singulus Technologies AG, Kahl am Main, Germany; 2. R&D, Singulus Technologies AG, Kahl am Main, Germany; 3. Institute for Microelectronics (IME), A*STAR, Singapore, Singapore; 4. Head of NDT, Singulus Technologies AG, Kahl am Main, Germany*

DL-02. **Optimization Design of Oil-immersed Transformer Windings Using Response Surface Method.** Y. Zhang[1], S. Ho[1] and *W. Fu*[1] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

DL-03. **Performance Enhancement of Q Factor and Inductance of Integrated RF Inductors.** *X. Wang*[1], H. Chen[1] and N. Sun[1] *1. Northeastern University, Boston, MA, United States*

DL-04. **Transformer magnetostriction and noise level consideration via PSO method.** *C. Hsu*[1] and M. Hsieh[2] *1. Department of Mechanical Engineering, Oriental Institute of Technology, New Taipei, Taiwan; 2. Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan*

DL-05. **Localized Magnetic and Magnetostrictive Characteristics in the Single-phase Transformer Core Magnetized with a DC Biased Magnetic Field.** Z. Wang[1], *Y. Zhang*[1], W. Jiang[2], D. Zhang[1], Z. Ren[1] and C. Koh[3] *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China; 2. School of Science, Shenyang University of Technology, Shenyang, China; 3. Chungbuk National University, Cheongju, The Republic of Korea*

DL-06. **Analysis and Design of Nanofluid-filled Power Transformers.** *X. Yang*[3], S. Ho[3], W. Fu[3], G. Xu[1], D. Peng[1] and W. Deng[2] *1. Department of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. Maintenance Branch, State Grid Jibei Electric Power Co. LTD, Beijing, China; 3. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

DL-07. **Rotational Core Loss Measurements of Steel Sheet Based on a Novel High Frequency 2-D Magnetization.** *Y. Li*[1], K. Zhang[1], S. Yue[1], C. Zhang[1] and Y. Dou[1] *1. Electrical Engineering, Hebei University of Technology, Tianjin, China*

DL-08. **Excess Losses in Gapped Amorphous and Nanocrystalline Tape Core Inductors Under a DC Bias.** *H. Kosai*[1,2], Z. Turgut[1], T. Bixel[1,2], L. Raymond[1,2] and J. Scofield[1] *1. UES Inc., Dayton, OH, United States; 2. Air Force Research Laboratory, Wright-Patterson AFB, OH, United States*

DL-09. **Novel Remanence Determination for Power Transformers Based on Magnetic Inductance Measurement.** *X. Li*[1,2], H. Zhang[1], M. Yang[3,2], S. Hu[1] and F.D. Leon[2] *1. Wuhan University of Technology, Wuhan, China; 2. New York University, New York, NY, United States; 3. Chongqing University, Chongqing, China*

DL-10. **A Novel Method for Calculating Vibration and Noise of Three-phase Dry-type Transformer.** *N. Yan*[1], B. Zhang[1], Z. Xing[1] and W. Li[1] *1. Shenyang University of Technology, Shenyang, China*

Session DM
HARD MAGNETIC MATERIALS THEORY AND APPLICATION I
(Poster Session)

Bhaskar Das, Chair
Ames Laboratory, US DOE, Iowa State University, Ames, IA, United States

DM-01. The Effect of Interstitial Nitrogen on the Structural Properties of Super Cells of $NdFe_{12-x}Ti_x$ at Low Ti at.%. *C. Skelland*[1], S.C. Westmoreland[2], T.A. Ostler[3], R.F. Evans[2], R.W. Chantrell[2], M. Yano[4], T. Shoji[5], A. Manabe[5], A. Kato[5], M. Ito[5], M. Winklhofer[6], G. Zimanyi[7], J. Fischbacher[8], T. Schrefl[8] and G. Hrkac[1] *1. University of Exeter, Exeter, United Kingdom; 2. University of York, York, United Kingdom; 3. Sheffield Hallam University, Sheffield, United Kingdom; 4. MagHEM, Susono, Japan; 5. Toyota Motor Corporation, Susono, Japan; 6. University of Duisburg, Duisburg, Germany; 7. UC Davis, Davis, CA, United States; 8. Danube University Krems, Krems an der Donau, Austria*

DM-02. Coercivity evolution and suppressed thermally activated defects in diffusion processed Nd-Fe-B. F. Wei[1], G. Yao[1], S. Chen[1], X. Fan[2], X. Yin[2], *Q. Xiang*[3], W. Cui[1,2] and Q. Wang[1] *1. Northeastern Unviersity, Shenyang, China; 2. Northwestern Polytechnical University, Xi'an, China; 3. National Institute for Material Science, Tskuba, Japan*

DM-03. Experimental investigation of the relationship between magnetic properties of permanent magnet and temperature and pressure coupling environment. *L. Xiao*[1], G. Yu[1], J. Zou[1], Y. Xu[1], B. Zheng[1] and H. Lan[1] *1. Harbin Institute of Technology, Harbin, China*

DM-04. Theoretial Study of Gilbert Damping in Rare-Earth Permanent Magnets. *F. Saito*[1], D. Miura[1] and A. Sakuma[1] *1. Dept. of Applied Physics, Tohoku University, Sendai, Japan*

DM-05. Electronic Structure of τ-phase MnAl-C Alloy. *M. Choi*[1], Y. Hong[1], H. Won[1], W. Lee[1], S. Kim[2], H. Lee[2], W. Lee[2], S. Kim[3] and G.J. Mankey[4] *1. Department of Electrical and Computer Engineering and MINT Center, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Materials Science and Engineering, Yonsei University, Seoul, The Republic of Korea; 3. Department of Physics and Astronomy and Center for Computational Sciences, Mississippi State University, Starkville, MS, United States; 4. Department of Physics and Astronomy and MINT Center, The University of Alabama, Tuscaloosa, AL, United States*

DM-06. **Magnetic and Structural Parameters of $Fe_5(Si_{0.75}Ge_{0.25})B_2$ Single Crystals.** *B. Lejeune*[1], S. Thimmaiah[2], I. McDonald[1], A. Gabay[3], M.J. Kramer[2], L.H. Lewis[1] and G. Hadjipanayis[3] *1. Chemical Engineering, Northeastern University, Boston, MA, United States; 2. Division of Materials Science and Engineering, U.S. Department of Energy Ames Laboratory, Ames, IA, United States; 3. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States*

DM-07. **Electrical resistivity and magnetic performance of ceramics-bonded Nd-Fe-B-type magnet consolidated using dielectric oxide binder.** *M. Kang*[1], K. Kim[1], H. Kwon[1], D. Kim[2], J. Lee[3] and K. Shin[4] *1. Pukyong National University, Busan, The Republic of Korea; 2. Star-group Ind. Co., Daegu, The Republic of Korea; 3. Korea Institute of Materials Science, Changwon, The Republic of Korea; 4. Kyungsung University, Busan, The Republic of Korea*

DM-08. **Intrinsic Properties, Phase Constitute and Microstructure of Novel R-Fe-B Strip-casting Alloys Based on Misch Metal.** Y. Liu[1,2], X. Zhang[3], X. Wang[3], *Q. Ma*[3,1], F. Liu[3], T. Zhao[1] and B. Shen[1] *1. State Key Laboratory of Magnetism, Institute of Physics, Chinese Academic of Sciences, Beijing, China; 2. University of Chinese Academic of Sciences, Beijing, China; 3. School of Science, Inner Mongolia University of Science & Technology, Baotou, China*

DM-09. **Microstructure Characteristics and Magnetic Domain Observation of 2:17 SmCo Commercial Magnet with Different Coercivity.** *Z. Xie*[1], D. Zhang[1], Z. Shang[1], W. Liu[1], M. Yue[1], H. Zhang[1] and Q. Wu[1] *1. College of Materials Science and Engineering, Beijing University of Technology, Beijing, China*

WEDNESDAY
AFTERNOON
1:30

EXHIBIT HALL A

Session DN
MAGNETIC PARTICLES AND HYPERTHERMIA (Poster Session)

Joseph Davies, Chair
NVE Corporation, Eden Prairie, MN, United States

DN-01. **High Magnetic Moment Metal-Polymer Nanoparticles with Superparamagnetic-Like Characteristics.** *I. Nekrashevich*[1] and D. Litvinov[1,2] *1. Electrical and Computer Engineering, University of Houston, Houston, TX, United States; 2. Nanofabrication Facility, University of Houston, Houston, TX, United States*

DN-02. **Smart Magnetic-stimuli Magnetorheological Response of Soft-magnetic Manganese Ferrite Nanoparticles.** C. Gao[1], Q. Lu[1] and *H. Choi*[1] *1. Department of Polymer Science and Engineering, Inha University, Incheon, The Republic of Korea*

DN-03. **Synthesis of Greigite (Fe_3S_4) Nanoparticles via a PVP-assisted Hydrothermal Method.** *J. Moore*[1], E. Nienhuis[1], M. Ahmadzadeh[1] and J. McCloy[1] *1. School of Mechanical and Materials Engineering, Washington State University, Pullman, WA, United States*

DN-04. **Combined action of magneto-mechanical effect with hyperthermia and stem cell delivery of Fe-Cr-Nb-B magnetic particles on cancer cell destruction.** *H. Chiriac*[1], E. Radu[1,2], D. Herea[1], L. Labusca[1] and N. Lupu[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania; 2. Faculty of Physics, Alexander Ioan Cuza University of Iasi, Iasi, Romania*

DN-05. **High intrinsic loss power of multi-core magnetic nanoparticles with long blood-pooling property for hyperthermia.** *K. Nishimoto*[1], S. Trisnanto[1], S. Ota[2], T. Yamada[1] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. Electrical and Computer Engineering, Shizuoka University, Hamamatsu, Japan*

DN-06. **Magnetic Combination Therapy: A New, Drug-free Approach to Cancer Treatment.** I. Rodrigo Arrizabalaga[1,2], M. Stanton[3], D.P. Valdés[4], *E. Welbourne*[3], B. Herrero de la Parte[5], T.E. Torres[6,7], E. Lima, Jr.[6,7], E. De Biasi[6,7], R.D. Zysler[6,7], J.A. García[1,8], F. Plazaola[2] and R. Cowburn[3] *1. Basque Center for Materials, Applications and Nanostructures, Leioa, Spain; 2. Department of Electricity and Electronics, University of the Basque Country (UPV/EHU), Leioa, Spain; 3. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 4. Instituto Balseiro, Rio Negro, Argentina; 5. Department of Surgery and Radiology and Physical Medicine, University of the Basque Country (UPV/EHU), Leioa, Spain; 6. Laboratorio de Resonancias Magnéticas, Gerencia de Física, Centro Atómico Bariloche, CNEA, Rio Negro, Argentina; 7. Ministerio de Ciencia, Tecnología e Innovación Productiva, Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Buenos Aires, Argentina; 8. Department of Applied Physics II, University of the Basque Country (UPV/EHU), Leioa, Spain*

DN-07. **Magnetosome-like nanoparticle systems for magnetic hyperthermia: modeling the effect of dipolar interactions.** *D.P. Valdés*[1,2], E. De Biasi[1,2], E. Lima Jr.[2] and R.D. Zysler[1,2] *1. Instituto Balseiro, San Carlos de Bariloche, Argentina; 2. Laboratorio de Resonancias Magnéticas, Centro Atómico Bariloche, Gerencia de Física, CNEA, San Carlos de Bariloche, Argentina*

DN-08. **High biocompatibility and specific loss power of magnetic nanoparticles for hyperthermia.** *G. Shi*[1], S. Trisnanto[1], T. Yamada[1], S. Ota[2] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. Electrical and Electronic Engineering, Shizuoka University, Hamamatsu, Japan*

DN-09. **Superparamagnetic Fe_3O_4 Magnetic Nanoparticles: Examination of their Feasibility for Hyperthermia Treatment for Cancer.** *A. Cordeiro*[1], B. Meneses Brassea[1], M. Ortega-Neder[1], C.M. Cyr[1], C.E. Botez[1] and A.A. El-Gendy[1] *1. Physics, The University of Texas at El Paso, El Paso, TX, United States*

DN-10. **Dynamic Hysteresis Loops and Specific Loss Power of Iron Oxide Nanoflowers in the Nonlinear Regime.** *Z. Boekelheide*[1], J.T. Miller[1] and C. Gruettner[2] *1. Physics, Lafayette College, Easton, PA, United States; 2. Micromod Partikeltechnologie GmbH, Rostock, Germany*

WEDNESDAY AFTERNOON 1:30 | EXHIBIT HALL A

Session DO
MOTORS: MODELING AND SIMULATIONS IV (Poster Session)
Wei Hua, Chair
Southeast University, Nanjing, China

DO-01. **Linear Scalar Magnetic Potential Interpolation For Non-conformal Meshing in Mesh Based Generated Reluctance Networks.** *S. Asfirane*[1], S. Hlioui[3,1], S. Mezani[2], Y. Amara[5], O. de la Barrière[4,1], G. Barakat[5] and M. Gabsi[1] *1. SATIE, ENS Paris Saclay, Cachan, France; 2. GREEN-UHP, Faculté des Sciences, Nancy, France; 3. CNAM, Paris, France; 4. CNRS, Cachan, France; 5. GREAH, Université Le Havre Normandie, Le Havre, France*

DO-02. **Analytical Modeling of Novel Hybrid Magnet Dual-Stator Field Modulation Machine.** H. Wang[1,2], S. Fang[1], H. Yang[1], Y. Li[1], *Z. Pan*[1] and H. Lin[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC), University of Wisconsin-Madison, Madison, WI, United States*

DO-03. **Loss Analysis and Experimental Verification of High-Speed Permanent Magnet Synchronous Machine Considering Current Harmonics.** *K. Shin*[1], H. Park[2] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea; 2. Hyundai Mobis, Yongin, The Republic of Korea*

DO-04. **Electromagnetic Analysis of the Saturation Effect with Different Nonlinear Soft Magnetic Materials of a Balanced Armature Receiver.** *D. Xu*[1], Y. Jiang[2] and S. Hwang[2] *1. School of Mechatronics Engineering and Automation, Shanghai University, Shanghai, China; 2. Mechanical Engineering, Pusan National University, Busan, The Republic of Korea*

DO-05. **A Novel Dual-Flux-Modulation Linear Permanent-Magnet Machine.** *Y. Zhou*[1], Y. Gao[1], R. Qu[1] and C. Shi[1] *1. Huazhong University of Science and Technology, Wuhan, China*

DO-06. **Multi-physical coupling analysis of balanced armature receiver by lumped parameter method, finite element method and boundary element method.** *Y. Jiang*[1], D. Xu[2], J. Kim[1] and S. Hwang[1] *1. School of Mechanical Engineering, Pusan National University, Busan, The Republic of Korea; 2. School of Mechatronics Engineering and Automation, Shanghai University, Shanghai, China*

DO-07. **Demagnetization Computation of Outer-Rotor Flux Switching Permanent Magnet Motor Considering Magnet Region Division.** D. Fan[1] and *L. Quan*[1] *1. Jiangsu Univerisity, Zhenjiang, China*

DO-08. **Cogging Torque Reduction on Transverse Flux Motor with Multilevel Skew Configuration of Toothed Cores.** *Y. Ueda*[1] and H. Takahashi[1] *1. Toshiba, Kawasaki, Japan*

DO-09. **An Analytical and Numerical Hybrid Model for Static Characteristics of a Interior Permanent Magnet Machine.** *P. Jin*[1], Y. Guo[1], Z. Pan[2] and S. Lyu[2] *1. Department of Electric Power Engineering, College of Electrical Engineering, Hohai University, Nanjing, China; 2. School of Electrical Engineering, Southeast University, Nanjing, China*

WEDNESDAY AFTERNOON 1:30 | EXHIBIT HALL A

Session DP
MOTORS: MODELING AND SIMULATIONS V (Poster Session)

Siavash Pakdelian, Chair
University of Massachusetts Lowell, Lowell, MA, United States

DP-01. **Impact of Eccentricity on a Low Reactance High-Speed, High-Frequency Slotless PMSM.** *D. Lee*[1], S. Sirimanna[1], K. Haran[1] and S. Salon[2] *1. Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 2. Electrical, Computer, & Systems Engineering, Rensselaer Polytechnic Institute, Troy, NY, United States*

DP-02. **Derivation of Optimal Skew Angle to Reduce Cogging Torque of Magnetic-Geared Permanent Magnet Synchronous Motor for Railway Vehicles.** *I. Jo*[1], H. Lee[1], G. Jeong[2], W. Ji[1] and C. Park[3] *1. Department of Railway Vehicle System Engineering, Korea National University of Transportation, Uiwang-si, The Republic of Korea; 2. Department of Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 3. Department of Railroad Operation System Engineering, Korea National University of Transportation, Uiwang-si, The Republic of Korea*

DP-03. **Utilization of Reluctance Torque to Improve Starting Torque and Average Torque of a Brushless-Wound Field Synchronous Machine.** *M. Ayub*[1] and B. Kwon[1] *1. Hanyang University, Ansan, The Republic of Korea*

DP-04. **Determination Scheme of Field Circuit Constants for Improving Running Efficiency in Single-Phase Induction Motor.** *H. Kim*[1], K. Kim[1] and G. Park[1] *1. Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*

DP-05. **Design and Analysis of A Novel Stator-Segmented SRM for In-Wheel Electric Vehicle Application.** *K. Diao*[1], X. Sun[1], G. Lei[2] and J. Zhu[3] *1. Jiangsu University, Zhenjiang, China; 2. University of Technology, Sedney, Sedney, NSW, Australia; 3. The University of Sedney, Sydney, NSW, Australia*

DP-06. **A Novel DC Bias Excited Machine with Integrated Winding.** *Q. Wang*[1] and S. Niu[1] *1. Hong Kong Polytechnic University, Hung Hom, Hong Kong*

DP-07. **Influence of Design Parameters on On-Load Demagnetization Characteristics of Switched Flux Memory Machine.** *S. Lyu*[1], H. Yang[1], H. Lin[1], Z. Zhu[2] and Z. Pan[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

DP-08. **Analysis and Calculation of Zigzag Leakage Flux in Surface-Mounted Permanent Magnet Motor with Similar Number of Poles and Slots.** Z. Yu[1], *Y. Li*[1], Y. Jing[1] and J. Du[1] *1. National Engineering Research Center for REPM Electrical Machines, Shenyang University of Technology, Shenyang, China*

DP-09. **Improvement of Systematic Efficiency in a High-Speed Single-Phase Brushless DC Motor using Multi-Physics Analysis for a Vacuum Cleaner.** *Y. Choo*[1], C. Kim[1], J. Cho[1], H. Hwang[1], J. Kim[1], J. Choi[2], S. Hwang[2] and C. Lee[1] *1. Pusan National University, Busan, The Republic of Korea; 2. Kyungsung University, Busan, The Republic of Korea*

WEDNESDAY AFTERNOON 1:30 — EXHIBIT HALL A

Session DQ
MAGNETIC INSTRUMENTATION AND CHARACTERIZATION I (Poster Session)

Martina Ahlberg, Chair
University of Gothenburg, Gothenburg, Sweden

DQ-01. **High spatial and temporal resolution magnetic imaging at the PolLux endstation of the Swiss Light Source.** *S. Finizio*[1], S. Wintz[1], K. Witte[1], S. Mayr[1], B. Watts[1] and J. Raabe[1] *1. Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland*

DQ-02. **Non-destructive *in situ* Imaging for Investigating Spintronic Devices.** *E. Jackson*[1], W. Frost[1], J. Kim[1], M. Samiepour[1] and A. Hirohata[1] *1. Department of Electronics, University of York, York, United Kingdom*

DQ-03. **Scanning Microwave Microscopy for Probing Electrical and Magnetic Properties of Ferromagnetic Thin Films.** *N. Sernicola*[1], D. Kumar[1], V. Chaudhary[1] and S. Piramanayagam[1] *1. Division of PAP, SPMS, Nanyang Technological University, Singapore, Singapore*

DQ-04. **Structural Mapping of Co-HfO_2 Granular Films using Conductive Atomic Force Microscopy.** *A.K. Toh*[1] and V. Ng[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore*

DQ-05. **A Method for Measuring Magnetostriction of Amorphous and Nanocrystalline Materials under Different Frequency Excitation.** *P. Zhang*[1] and L. Li[1] *1. State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources(North China Electric Power University), Beijing, China*

DQ-06. **Issues with Background Subtraction in Magnetometry Measurements of High Coercivity Samples.** *A. Mandru*[1], O. Yildirim[1], M. Penedo[1], X. Zhao[1], M.A. Marioni[1] and H.J. Hug[1,2] *1. Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; 2. Department of Physics, University of Basel, Basel, Switzerland*

DQ-07. **Morphological Phase Transition of Magnetic Domains in Co(12Å)/Pt(7Å) Multilayers.** *L.A. Ortiz*[1] and K. Chesnel[2] *1. Physics and Electronics, University of Puerto Rico - Humacao, Yabucoa, Puerto Rico; 2. Brigham Young University, Provo, UT, United States*

DQ-08. **Optimizing Magnetic Recording Media for Nanoparticle Self-Assembly: Using Non-Magnetic Layer Substitution to Isolate Hard Layer Magnetism.** *S. FitzGerald*[1,2] and T. Crawford[1,2] *1. SmartState Center for Experimental Nanoscale Physics, University of South Carolina, Columbia, SC, United States; 2. Department of Physics and Astronomy, University of South Carolina, Columbia, SC, United States*

WEDNESDAY AFTERNOON 1:30 — EXHIBIT HALL A

Session DR
SOFT MAGNETIC MATERIALS IV: CRYSTALLINE, NANOCRYSTALLINE AND AMORPHOUS MATERIALS (Poster Session)

Radhika Barua, Chair
Virginia Commonwealth University, Richmond, VA, United States

DR-01. **Clustering Effect on Eddy Current and Magnetic Properties in Metallic Particle-Loaded Magneto-Dielectric Composites.** *Q. Li*[1], Y. Chen[2] and V.G. Harris[1] *1. Electrical and Computer Engineering, Northeastern University, Boston, MA, United States; 2. Innovation Center, Rogers Corporation, Burlington, MA, United States*

DR-02. **Compaction behaviors and magnetic properties of bi-modal Fe-based powders.** *M. Choi*[1], M. Kim[1], K. Lee[1], J. Song[1] and J. Kim[1] *1. Material Engineering, Hanyang University, Ansan, The Republic of Korea*

DR-03. **A combined FORC and neutron scattering investigation of microstructural changes in thermally aged Fe-1wt%Cu alloy.** *S. Kobayashi*[1], R. Kawagoe[1], H. Murakami[1], K. Ohishi[2], Y. Kawamura[2] and J. Suzuki[2] *1. Iwate University, Morioka, Japan; 2. CROSS, Tokai, Japan*

DR-04. **Carbon Tailoring and Structure Evolution in Mn_3GaC_x Compounds.** E.T. Dias[1], *A.K. Nigam*[1] and K.R. Priolkar[2] *1. Department of Condensed Matter Physics, Tata Institute of Fundamental Research, Mumbai, India; 2. Department of Physics, Goa University, Taleigao, India*

DR-05. **Loss decomposition and Barkhausen noise in plastically deformed steel sheets.** *O. de la Barrière*[1], C. Ragusa[2], F. Landgraf[3], D. Luiz Rodrigues Junior[3], F. Mazaleyrat[1], S. Bagnis[2], A. Magni[4], F. Fiorillo[4] and C. Appino[4] *1. SATIE, Cachan, France; 2. Politecnico di Torino, Torino, Italy; 3. University of São Paulo, São Paulo, Brazil; 4. INRIM, Torino, Italy*

DR-06. **Characteristic of high frequency Fe-Si-Cr motor component by selective laser melting.** T. Chang[1], K. Jhong[2], W. Lee[2], *M. Tsai*[1,3] and I. Jiang[1] *1. Electric Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Electrical Engineering, National Cheng Kung University, Tainan, Taiwan; 3. Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan*

DR-07. **Influence of Ball Milling on magnetic properties of $(Fe_{1-x}Mn_x)_{75}P_{15}C_{10}$ Alloy Ribbons.** *M. Islam*[1], M.A. Bally[1], S. Satter[2] and M.A. Khan[1] *1. Physics, Bangladesh University of Engineering and Technology(BUET), Dhaka, Bangladesh; 2. Department of Electrical and Electronic Engineering, University of Dhaka, Dhaka, Bangladesh*

DR-08. **Unusually Inverted Dynamic and Static Magnetic Hysteresis Loops of $Co_{70-x}Fe_xB_{10}Si_{10}$ with $x = 0$ and 10 (at. %).** *A. Rosales-Rivera*[1], N. Salazar-Henao[1], A. Velásquez-Salazar[1], I.G. Cely-Orjuela[1] and M. Gómez-Hermida[2] *1. Laboratorio de Magnetismo y Materiales Avanzados, Universidad Nacional de Colombia, Sede Manizales, Manizales, Colombia; 2. Departamento de Ciencias Básicas, Facultad de Ciencias Básicas e Ingeniería, Universidad Católica de Pereira, Pereira, Colombia*

WEDNESDAY
AFTERNOON
4:30

SALONS 2 & 3

Session YA
PLENARY

Suzanne G.E. te Velthuis, Chair
Argonne National Laboratory, Argonne, IL, United States

4:30

Welcome
Pallavi Dhagat, Oregon State University, IEEE Magnetics Society President

Awards Presentation by the IEEE Magnetics Society
Jürgen Fassbender, HZDR, Honors and Awards Committee Chair

YA-01. **Quantum Magnetism: an Unfinished Revolution.** ***(Invited)*** *M. Aronson[1] 1. University of British Columbia, Vancouver, BC, Canada*

THURSDAY
MORNING
8:30

SALON 2

Session EA
3D MAGNETIC FRUSTRATION: PYROCHLORE, SPINEL AND FCC LATTICES

Jeffrey Lynn, Chair
NIST, Gaithersburg, MD, United States

8:30

EA-01. **High pressure routes to new pyrochlores and novel magnetism.** ***(Invited)*** *C. Wiebe[1,2] 1. University of Winnipeg, Winnipeg, MB, Canada; 2. CIFAR, Toronto, ON, Canada*

9:06

EA-02. **Order and Disorder in Spin Liquids from Diffuse Magnetic Neutron Scattering.** ***(Invited)*** *J. Paddison[1,2]*, Z. Dun[2,3], X. Bai[2], M. Daum[2], H. Ong[1], J. Hamp[1], P. Mukherjee[1], N. Butch[5], M. Tucker[4], Y. Liu[4], A. Goodwin[6], C. Castelnovo[1], H. Zhou[3], S. Dutton[1] and M. Mourigal[2] *1. Department of Physics, University of Cambridge, Cambridge, United Kingdom; 2. School of Physics, Georgia Tech, Atlanta, GA, United States; 3. Department of Physics and Astronomy, University of Tennessee, Knoxville, TN, United States; 4. Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 5. NIST Center for Neutron Research, NIST, Gaithersburg, MD, United States; 6. Department of Chemistry, University of Oxford, Oxford, United Kingdom*

9:42

EA-03. **Ground State Selection in Quantum XY Pyrochlore Magnets.** ***(Invited)*** *B. Gaulin[1] 1. Physics and Astronomy, McMaster University, Hamilton, ON, Canada*

10:18

EA-04. **Competing orders and topological excitation in spin-1 pyrochlore antiferromagnets.** ***(Invited)*** *G. Chen*[1] and F. Li[1] *1. Physics, Fudan Univ, Shanghai, China*

10:54

EA-05. **Structural Tuning of Orbital and Spin Order in Frustrated Antiferromagnets.** ***(Invited)*** *C. Beekman*[1,2], C.J. Thompson[3,2], D. Reig-i-Plessis[5], L. Kish[5], A. Aczel[4], B. Zhang[1,2], E. Karapetrova[6] and G. MacDougall[5] *1. Physics, Florida State University, Tallahassee, FL, United States; 2. National High Magnetic Field Laboratory, Tallahassee, FL, United States; 3. Materials Science and Engineering Program, Florida State University, Tallahassee, FL, United States; 4. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 5. Physics, University of Illinois at Urbana-Champaign, Champaign, IL, United States; 6. Advanced Photon Source, Argonne National Laboratory, Argonne, IL, United States*

THURSDAY MORNING 8:30 | SALON 3

Session EB
MAGNETISM FOR THE BRAIN: CHALLENGES AND SOLUTIONS

Ravi Hadimani, Co-Chair
Virginia Commonwealth University, Richmond, VA, United States
Montserrat Rivas, Co-Chair
Universidad de Oviedo, Gijón, Spain

8:30

EB-01. **Magnetic Nanorobots to Cross the Blood-brain Barrier.** ***(Invited)*** *S. Martel*[1] *1. Computer and Software Engineering, Polytechnique Montreal, Montreal, QC, Canada*

9:06

EB-02. **Magnetoencephalography with conformal microfabricated optically-pumped magnetometer arrays.** ***(Invited)*** S. Krzyzewski[1], N. Nardelli[1], B. Korenko[1], G. Romanov[1], J. Hughes[1,2], O. Alem[1,2] and *S. Knappe*[1,2] *1. Department of Mechanical Engineering, University of Colorado, Boulder, CO, United States; 2. FieldLine Inc., Lafayette, CO, United States*

9:42

EB-03. **Design and demonstration of novel magnetoencephalogram detectors.** ***(Invited)*** *T. Uchiyama*[1] and J. Ma[1] *1. Electrical Engineering, Nagoya University, Nagoya, Japan*

10:18

EB-04. **Recent Developments in Deep Brain Stimulation using Magnetic Fields for Non-invasive Therapy of Brain Disorders.** ***(Invited)*** *D.C. Jiles*[1] *1. Iowa State University, Ames, IA, United States*

10:54

EB-05. **Cell Tracking Using Magnetic Particles: from MRI to MPI.** ***(Invited)*** *J. Bulte*[1] *1. Johns Hopkins University School of Medicine, Baltimore, MD, United States*

THURSDAY MORNING 8:30 — SALON 1

Session EC
SKYRMIONS II
Stephen McVitie, Chair
University of Glasgow, Glasgow, United Kingdom

8:30

EC-01. **Nucleation, Stability and Dynamics of Topological Spin Structures.** ***(Invited)*** *A. Soumyanarayanan*[1] *1. Institute of Materials Research & Engg (IMRE), Agency for Science, Technology & Research (A*STAR), Singapore, Singapore*

9:06

EC-02. **Polarized neutron reflectometry measurements to detect chiral bobbers in FeGe thin films.** *R. Need*[1], A. Ahmed[2], R. Bennett[2], R. Kawakami[2] and B.J. Kirby[1] *1. NIST Center for Neutron Research, Gaithersburg, MD, United States; 2. Ohio State University, Columbus, OH, United States*

9:18

EC-03. **Ultrafast Domain Walls and Ultrasmall Skyrmions in a Compensated Ferrimagnet.** *L.M. Caretta*[1], M. Mann[1], F. Buettner[1], K. Ueda[1], B. Pfau[2], C. Günther[2], P. Hessing[2], A. Churikova[1], C. Klose[2], M. Schneider[2], D. Engel[2], C. Marcus[1], D. Bono[1], K. Bagschik[3], S. Eisebitt[2] and G. Beach[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology (MIT), Cambridge, MA, United States; 2. Max-Born-Institut, Berlin, Germany; 3. DESY, Hamburg, Germany*

9:30

EC-04. **Isolated magnetic skyrmions: from a fundamental understanding to the observation of ultrasmall skyrmions at room temperature.** *F. Buettner*[1], I. Lemesh[1], L.M. Caretta[1], M. Mann[1], K. Ueda[1], B. Pfau[2], C. Günther[3], P. Hessing[2], A. Churikova[1], M. Schneider[2], D. Engel[2], C. Klose[2], K. Bagschik[4], S. Eisebitt[2] and G. Beach[1] *1. Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Max Born Institut, Berlin, Germany; 3. TU Berlin, Berlin, Germany; 4. DESY, Hamburg, Germany*

9:42

EC-05. **Nonequilibrium skyrmion accumulation in Ir/Co/Pt heterostructure.** *S. Sugimoto*[1], S. Kasai[1], Y. Takahashi[1] and Y. Tokura[2,3] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. RIKEN Center for Emergent Matter Science, Wako, Japan; 3. Department of Applied Physics, University of Tokyo, Tokyo, Japan*

9:54

EC-06. **Confinement and Controlled Skyrmion Motion in Magnonic Antidot Lattices.** *S. Saha*[3,4], M. Mruczkiewicz[1,2], S. Finizio[4], M. Zelent[2], S. Wintz[4], A. Suszka[3,4], N.S. Bingham[3,4], J. Raabe[4], M. Krawczyk[2] and L. Heyderman[3,4] *1. Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; 2. Adam Mickiewicz University, Poznan, Poland; 3. ETH Zurich, Zurich, Switzerland; 4. Paul Scherrer Institute, Villigen, Switzerland*

10:06

EC-07. **Brownian motion of skyrmion bubbles on wire.** *Y. Jibiki*[1], M. Goto[1,3], T. Srivastava[2], W. Lim[2], S. Auffret[2], C. Baraduc[2], H. Bea[2], J. Cho[1,3], E. Tamura[1,3] and Y. Suzuki[1,3] *1. Osaka University, Osaka, Japan; 2. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec, Grenoble, France; 3. Osaka CSRN, Osaka, Japan*

10:18

EC-08. **Visualizing the Dynamics of sub-100 nm Néel Skyrmions in Multilayer Nanowires.** *A. Tan Kok Cheng*[1,2], P. Ho[1], L. Huang[1], J. Lourembam[1], S. Goolaup[1] and A. Soumyanarayanan[1] *1. Agency for Science, Technology and Research (A*STAR), Singapore, Singapore; 2. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom*

10:30

EC-09. **Thermal stability of metastable magnetic skyrmions: Entropic narrowing and significance of internal eigenmodes.** *L. Desplat*[1,2], D. Suess[3], J. Kim[2] and R. Stamps[4,1] *1. SUPA School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 2. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; 3. Christian Doppler Laboratory, Physics of Functional Materials, Faculty of Physics, University of Vienna, Vienna, Austria; 4. Department of Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada*

10:42

EC-10. **Direct observation of coherent and ferrimagnetic skyrmions in Co and Gd layers in $[Co/Gd/Pt]_n$ multilayers using X-PEEM.** *X. Wang*[1], A.T. Clark[1], Z. Yan[1], P.N. Lapa[2], M. Vogel[2], J. Pearson[2], D.J. Keavney[3], A. Hoffmann[2], S.G.E. te Velthuis[2] and X. Cheng[1] *1. Department of Physics, Bryn Mawr College, Bryn Mawr, PA, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Advanced Photon Source, Argonne National Laboratory, Lemont, IL, United States*

10:54

EC-11. **Controlled generation of room-temperature magnetic skyrmion bubble lattices in ultrathin films by ultrafast laser.** *S. Je*[1,2], P. Vallobra[2], T. Srivastava[1], J. Rojas-Sánchez[2], T. Pham[2], M. Hehn[2], G. Malinowski[2], C. Baraduc[1], S. Auffret[1], G. Gaudin[1], S. Mangin[2], H. Bea[1] and O. Boulle[1] *1. SPINTEC, Grenoble, France; 2. Institut Jean Lamour, Nancy, France*

11:06

EC-12. **Cascaded Skyrmion Logic System Inspired by Conservative Logic.** *X. Hu*[1], M. Chauwin[1,2], F. Garcia-Sanchez[3], N. Betrabet[1], C. Moutafis[4] and J.S. Friedman[1] *1. Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Department of Physics, Ecole Polytechnique, Palaiseau, France; 3. Istituto Nazionale di Ricerca Metrologica, Torino, Italy; 4. School of Computer Science, The University of Manchester, Manchester, United Kingdom*

11:18

EC-13. **Thermally excited skyrmion diffusion used in a reshuffler device.** J. Zazvorka[1], F. Jakobs[3], D. Heinze[1], K. Litzius[1,2], S. Jaiswal[1], S. Kromin[1], N. Keil[1], P. Virnau[1], D. Pinna[1], K. Everschor-Sitte[1,2], G. Jakob[1,2], A. Donges[3], U. Nowak[3] and *M. Kläui*[1,2] *1. Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 3. Physics, University of Konstanz, Konstanz, Germany*

THURSDAY MORNING 8:30 — MARYLAND

Session ED
SPINWAVES AND MAGNONICS
Dafiné Ravelosona, Chair
Institut d'Electronique Fondamentale, Orsay, France

8:30

ED-01. **Magnon Linewidths in YIG-based Waveguides at Millikelvin Temperatures.** *S. Kosen*[1], A.F. van Loo[1], L. Mihalceanu[2], D.A. Bozhko[2], A.A. Serga[2] and A.D. Karenowska[1] *1. Physics, University of Oxford, Oxford, United Kingdom; 2. Physics, Technische Universitaet Kaiserslautern, Kaiserslautern, Germany*

8:42

ED-02. **Magnonic crystals based on ultra-thin YIG: experimental realizations and micro-magnetic simulation insights.** *H.P. Merbouche*[1], M. Collet[1], M. Evelt[3], V.E. Demidov[3], L. Soumah[1], J.L. Prieto[4], M. Muñoz[5], J. Ben Youssef[6], G. de Loubens[7], O. Klein[8], S. Xavier[2], V. Cros[1], P. Bortolotti[1], S.O. Demokritov[3] and A. Anane[1] *1. Unité Mixte de Recherche CNRS/THALES, Palaiseau, France; 2. Thales Research & Technology, Palaiseau, France; 3. Institute for Applied Physics and Center for Nanotechnology, University of Muenster, Muenster, Germany; 4. Universidad Polytecnica de Madrid, Madrid, Spain; 5. Instituto de Microelectrónica de Madrid, Madrid, Spain; 6. Laboratoire de Magnetisme de Bretagne CNRS, Universite de Bretagne Occidentale, Brest, France; 7. CEA Saclay, Service de Physique de l'Etat Condense, Gif-sur-Yvette, France; 8. CEA-SPINTEC, Grenoble, France*

8:54

ED-03. **Strain-Controlled Magnonic Networks Based on Lateral Yttrium Iron Garnet Stripes and Magnonic Crystals.** *A.V. Sadovnikov*[1], E.N. Beginin[1], A. Grachev[1] and S. Nikitov[1,2] *1. Laboratory of Magnonics, Saratov State University, Saratov, Russian Federation; 2. IRE RAS, Moscow, Russian Federation*

9:06

ED-04. **Magnonic band diagram for spin density waves sustained in thin films.** *P. Sprenger*[1], M. Hoefer[1] and E. Iacocca[1] *1. Applied Mathematics, University of Colorado Boulder, Boulder, CO, United States*

9:18

ED-05. **Efficient Magnonic Spin Transport in Insulating Antiferromagnetic Thin Films.** *A. Ross*[1,2], R. Lebrun[1], S. Bender[3], J. Cramer[1,2], D. Ellis[4], A. Kay[4], D. Grave[4], L. Baldrati[1], J. Moussy[5], A. Brataas[6], A. Rothschild[4], R. Duine[3,6] and M. Kläui[1,2] *1. Johannes-Gutenberg University Mainz, Mainz, Germany; 2. Graduate School of Excellence Material Science in Mainz, Mainz, Germany; 3. Utrecht University, Utrecht, Netherlands; 4. Department of Materials Science and Engineering, Technion-Israel Institute of Technology, Haifa, Israel; 5. SPEC, CEA-Saclay, CNRS, Université Paris-Saclay, Paris, France; 6. Center for Quantum Spintronics, Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway*

9:30

ED-06. **Magnon transport in multilayer magnetic system.** *S. Ruta*[1], Z. Fu[2], T.A. Ostler[3], A. Kimel[4], R.F. Evans[1] and R.W. Chantrell[1] *1. Physics, University of York, York, United Kingdom; 2. Tongji University, Shanghai, China; 3. Sheffield Hallam University, Sheffield, United Kingdom; 4. Institute for Molecules and Materials, Radboud University Nijmegen, Nijmegen, Netherlands*

9:42

ED-07. **Emergent Magnon Motifs and Worm-like Nanochannels in Artificial Ferromagnetic Quasicrystals Created by Nanoholes in Amorphous CoFeB.** S. Watanabe[1], V.S. Bhat[1], K. Baumgärtl[1] and *D. Grundler*[1,2] *1. IMX-LMGN, EPFL, Lausanne, Switzerland; 2. IMT, EPFL, Lausanne, Switzerland*

9:54

ED-08. **Demonstration of dynamic control of the cavity-magnon exchange coupling.** *I. Boventer*[1,2], C. Dörflinger[2], T. Wolz[2], M. Kläui[1,3] and M.P. Weides[2,4] *1. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 2. Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; 3. University Mainz, Materials Science in Mainz, Mainz, Germany; 4. School of Engineering, University of Glasgow, Glasgow, United Kingdom*

10:06

ED-09. **Electrical determination of magnon band structure in narrow NiFe strip using parametric magnon excitation.** *G. Okano*[1] and Y. Nozaki[1,2] *1. Department of Physics, Keio Univ., Yokohama, Japan; 2. Center for Spintronics Research Network, Keio Univ., Yokohama, Japan*

10:18

ED-10. **3D transport of spin waves in curved nano-membranes.** ***(Invited)*** M. Zimmermann[1], J.A. Otalora Arias[2], S. Wintz[3], T. Schneider[4], H. Schultheiss[4], J. Lindner[4], J. Fassbender[4], C. Back[5] and *A. Kakay*[4] *1. Physics Department, University of Regensburg, Regensburg, Germany; 2. Leibniz-Institut für Festkörper- und Werkstoffforschung, Dresden, Germany; 3. Paul Scherrer Institute, Villigen, Switzerland; 4. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 5. Technical University Munich, München, Germany*

10:54

ED-11. **Graded Index Lenses for Spin Waves.** *N.J. Whitehead*[1], S.A. Horsley[1], T.G. Philbin[1] and V.V. Kruglyak[1] *1. Physics and Astronomy, University of Exeter, Exeter, United Kingdom*

11:06

ED-12. **Implementation of the Stimulated-Raman-Adiabatic-Passage mechanism in magnonics.** Q. Wang[1], P. Pirro[1], T. Brächer[1], A. Chumak[1] and *B. Hillebrands*[1] *1. Physics, TU Kaiserslautern, Kaiserslautern, Germany*

11:18

ED-13. **Magnon focusing in NiFe thin films using GHz repetition rate femtosecond laser pulses.** *S. Muralidhar*[1], A. Aleman[1], A.A. Awad[1], R.E. Camley[2], D. Hanstorp[1] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Physics Department, University of Colorado at Colorado Springs, Colorado Springs, CO, United States*

THURSDAY
MORNING
8:30

VIRGINIA

Session EE
MULTIFERROICS AND MAGNETOELECTRIC PHENOMENA II

Massimo Ghidini, Chair
University of Cambridge, Cambridge, United Kingdom

8:30

EE-01. **Strong magnetodielectric coupling in a Ru-based 6H-perovskite, $Ba_3RRu_2O_9$ (R=Nd, Ho).** *T. Basu*[1], A. Pautrat[1], V. Hardy[1], A. Loidl[2] and S. Krohns[2] *1. CRISMAT, CNRS, Caen, France; 2. Augsburg University, Augsburg, Germany*

8:42

EE-02. **Modulated magnetic structure in ^{57}Fe doped orthorhombic $YbMnO_3$: a Mössbauer study.** M. Duttine[2], A. Wattiaux[2], F. Balima[2], C. Decorse[3], H. Moutaabbid[4], *D. Ryan*[1] and P. Bonville[5] *1. Physics Department, McGill University, Montreal, QC, Canada; 2. CNRS, Université de Bordeaux, Pessac, France; 3. ICMMO, Université Paris-Sud, Orsay, France; 4. IMPMC, Sorbonne Universités, Paris, France; 5. CEA, Université Paris-Saclay, Gif-sur-Yvette, France*

8:54

EE-03. **Voltage Driven Magnetic Domain Wall Motion in FeCoSiB/PMN-PT(011) Multiferroic Heterostructures.** X. Zhao[1], *Z. Hu*[1], W. Hou[1], Q. Yang[1], M. Yao[1], L. Wang[1], Y. Cheng[1], Z. Zhou[1] and M. Liu[1] *1. Xi'an Jiaotong University, Xi'an, China*

9:06

EE-04. **Multiferroic Behavior in Fe-doped $BaTiO_3$ single crystals.** *M. Staruch*[1], H. ElBidweihy[2], M. Cain[3], P. Thompson[4] and P. Finkel[1] *1. U.S. Naval Research Laboratory, Washington, DC, United States; 2. Electrical and Computer Engineering Department, United States Naval Academy, Annapolis, MD, United States; 3. Electrosciences Ltd., Surrey, United Kingdom; 4. European Synchrotron Radiation Facility, Grenoble, France*

9:18

EE-05. **Magnetic properties of Gd-doped NFO - BTO nanocomposites.** T. Parida[1], B. Murty[2] and *G. Markandeyulu*[1] *1. Physics, IIT Madras, Chennai, India; 2. Metallurgical and Materials Engineering, IIT Madras, Chennai, India*

9:30

EE-06. **Non-Specular Optical Investigations of the Magnetic Properties of Rod-Like Multiferroic Janus Fibers.** *C.J. Dolbashian*[1], T. Crawford[1] and J. Andrew[2] *1. Physics and Astronomy, University of South Carolina, Columbia, SC, United States; 2. Material Science and Engineering, University of Florida, Gainesville, FL, United States*

9:42

EE-07. **Using Magnetic Field Chaining in Multiferroic Janus Nanofibers to Extract the Magnetoelectric Coupling.** *B. Chavez*[1,2], M.J. Bauer[3], J. Andrew[3] and T. Crawford[1,2] *1. Smart State Center for Experimental Nanoscale Physics, University of South Carolina, Columbia, SC, United States; 2. Department of Physics and Astronomy, University of South Carolina, Columbia, SC, United States; 3. Materials Science and Engineering, University of Florida, Gainesville, FL, United States*

9:54

EE-08. **Voltage-induced Magnetocapacitance in Magnetic Tunnel Junctions.** *H. Kaiju*[1], T. Misawa[1], T. Nagahama[2], T. Komine[3], O. Kitakami[4], M. Fujioka[1], J. Nishii[1] and G. Xiao[5] *1. Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan; 2. Graduate School of Engineering, Hokkaido University, Sapporo, Japan; 3. Faculty of Engineering, Ibaraki University, Hitachi, Japan; 4. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 5. Department of Physics, Brown University, Providence, RI, United States*

10:06

EE-09. **Withdrawn**

10:18

EE-10. **Room-Temperature Electric Field Controlled On-Off Ferromagnetism in a Single Metal Oxide Film.** *A. Quintana Puebla*[1,2], E. Menendez[2], M. Liedke[3], M. Butterling[3], A. Wagner[3], V. Sireus[2], P. Torruella[4,5], S. Estradé[4,5], F. Peiró[4,5], J. Dendooven[6], C. Detavernier[6], P. Murray[7], D. Gilbert[8,7], E. Pellicer[2], J. Nogues[9,10], J. Sort[2,10] and K. Liu[1] *1. Department of Physics, Georgetown University, Washington, DC, United States; 2. Physics Department, Universitat Autonoma de Barcelona, Cerdanyola del Vallès, Spain; 3. Nuclear Physics, Helmholtz-Zentrum Dresden-Rossendorf, Rossendorf, Germany; 4. Departament d'Enginyeria Electrònica i Biomèdica, Universitat de Barcelona, Barcelona, Spain; 5. Institute of Nanoscience and Nanotechnology, Universitat de Barcelona, Barcelona, Spain; 6. Department of Solid State Sciences, Universiteit Ghent, Ghent, Belgium; 7. Physics Department, University of California Davis, Davis, CA, United States; 8. Neutron-Condensed Matter Science, NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 9. Magnetic Nanostructures Group, Catalan Institute of Nanoscience and Nanotechnology, CSIC and BIST, Cerdanyola del Vallès, Spain; 10. Institució Catalana de Recerca i Estudis Avançats, Barcelona, Spain*

10:30

EE-11. **Voltage induced manipulation of domains and exchange bias in Fe thin films.** *J. Zehner*[1,2], I. Soldatov[1], S. Faehler[1], R. Huhnstock[3,4], D. Holzinger[3,4], A. Ehresmann[3,4], K. Nielsch[1,2], R. Schäfer[1] and K. Leistner[1,2] *1. IFW Dresden, Dresden, Germany; 2. TU Dresden, Dresden, Germany; 3. Institute of Physics and CINSaT, Kassel, Germany; 4. Univ. Kassel, Kassel, Germany*

10:42

EE-12. **Voltage control of RKKY interaction for AFM-FM spintronic devices.** *Q. Yang*[1], X. Wang[2], L. Wang[1], Z. Zhou[1], N. Sun[2] and M. Liu[1] *1. Xi'an Jiaotong University, Xi'an, China; 2. Northeastern University, Boston, MA, United States*

10:54

EE-13. **Tunable giant magnetoimpedance in magnetoelectric heterostructures.** *Z. Wang*[1], W. Su[1], Z. Hu[1], Z. Zhou[1] and M. Liu[1] *1. ECE, Xi'an Jiaotong University, Xi'an, China*

11:06

EE-14. **Magneto-ionic control of magnetism using a solid state proton pump.** *A. Tan*[1], M. Huang[1], C. Avci[1], F. Buettner[1,2], W. Hu[2], C. Mazzoli[2], H.L. Tuller[1] and G. Beach[1] *1. Materials Science and Engineering, MIT, Cambridge, MA, United States; 2. Brookhaven National Laboratory, Upton, NY, United States*

11:18

EE-15. **Effect of dopant-induced defects on structural and enhanced ferromagnetism and magnetoelectric properties of Dy and Sr co-doped $BiFeO_3$ at room temperature.** *M. Muniyandi*[1] and A. Fakhrabadi[1] *1. Mechanical Engineering, University of Chile, Beauchef, Chile*

THURSDAY MORNING 8:30 | DELAWARE

Session EF
MAGNETIZATION DYNAMICS II
Marco Battiato, Chair
Nanyang Technological University, Singapore, Singapore

8:30

EF-01. **Ultralow Damping in Epitaxial Spinel Ferrite Thin Films.** *S. Emori*[1,2], D. Yi[2], S. Crossley[2], J.J. Wisser[2], L.J. Riddiford[2], P.P. Balakrishnan[2], B. Khodadadi[1], P. Shafer[3], C. Klewe[3], A.T. N'Diaye[3], B.T. Urwin[4], K. Mahalingam[4], B.M. Howe[4], H. Hwang[2], E. Arenholz[3] and Y. Suzuki[2] *1. Virginia Tech, Blacksburg, VA, United States; 2. Stanford University, Stanford, CA, United States; 3. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 4. Air Force Research Laboratory, WPAFB, OH, United States*

8:42

EF-02. **Giant Anisotropy of Gilbert Damping in Epitaxial FeCo Films.** Y. Li[1,2], F. Zeng[3], S. Zhang[2], H. Shin[2,4], H. Saglam[2,5], V. Karakas[2,6], O. Ozatay[2,6], J. Pearson[2], O. Heinonen[2], Y. Wu[3], A. Hoffmann[2] and *W. Zhang*[1,2] *1. Physics, Oakland University, Rochester, MI, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Physics, Fudan University, Shanghai, China; 4. Computational Sciences Division, Argonne National Laboratory, Lemont, IL, United States; 5. Physics, Illinois Institute of Technology, Chicago, IL, United States; 6. Physics, Bogazici University, Istanbul, Turkey*

8:54

EF-03. **Two-magnon Scattering and Magnetization Damping in Epitaxial Heusler Compound Films.** T.A. Peterson[1], *W. Peria*[1], T. Qu[2], A.P. McFadden[3,4], R.H. Victora[2], C.J. Palmstrøm[3,4] and P.A. Crowell[1] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 3. Department of Electrical & Computer Engineering, University of California, Santa Barbara, CA, United States; 4. Department of Materials, University of California, Santa Barbara, CA, United States*

9:06

EF-04. **Electron-Mediated Spin Pumping into Biased Antiferromagnetic IrMn: Absence of Anisotropic Damping.** *B. Khodadadi*[1], Y. Lim[1], D. Smith[1], R. Greening[1], Y. Zheng[2], C. Kaiser[2] and S. Emori[1] *1. Physics, Virginia Tech, Blacksburg, VA, United States; 2. Western Digital, Fremont, CA, United States*

9:18

EF-05. **Low Gilbert damping for epitaxial thin films of the equiatomic CoFeMnSi Heusler alloy.** *L. Bainsla*[1], R. Yilgin[1], M. Tsujikawa[2,3], K. Suzuki[1,3], M. Shirai[2,3] and S. Mizukami[1,3] *1. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 3. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

9:30

EF-06. **Damping Constant and Interfacial Anisotropy in Co/Pt Multilayers.** Z. Dai[1,2], B. Zhou[1,3] and *J. Zhu*[1,2] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Department of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Materials Science and Engineering Department, Carnegie Mellon University, Pittsburgh, PA, United States*

9:42

EF-07. **Theory of magnetization damping in chiral magnetic textures.** *C.A. Akosa*[1], A. Takeuchi[2], Z. Yuan[3] and G. Tatara[1,4] *1. RIKEN Center for Emergent Matter Science (CEMS), RIKEN, Wako, Saitama 351-0198, Japan; 2. Department of Physics and Mathematics, Aoyama Gakuin University, Sagamihara, Kanagawa 252-5258, Japan; 3. The Center for Advanced Quantum Studies and Department of Physics, Beijing Normal University, 100875 Beijing, China; 4. RIKEN Cluster for Pioneering Research (CPR), RIKEN, Wako, Saitama, 351-0198, Japan*

9:54

EF-08. **A First Principle Study of Antiferromagnetic Resonance Linewidth in Metallic Systems: The Crucial Role of Interlattice Spin Current.** *F. Mahfouzi*[1] and N. Kioussis[1] *1. Physics and Astronomy, California State University, Northridge, Northeidge, CA, United States*

10:06

EF-09. **Mutual Synchronization of Spin Torque Nano Oscillator by Magnetic Field coupling.** H. Singh[1], A. Bose[1], S.S. Bhuktare[1], A. Fukushima[2], K. Yakushiji[2], H. Kubota[2], S. Yuasa[2] and *A. Tulapurkar*[1] *1. Electrical Engineering, Indian Institute of Technology, Bombay, Bombay, India; 2. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Ibaraki, Japan*

10:18

EF-10. **Study on the Magnetization Dynamics of Fe-Si Thin Films Using Our Proposed Measurement Technique.** *Y. Endo*[1,2], O. Mori[3], Y. Shimada[1], S. Yabukami[4], S. Sato[3] and R. Utsumi[3] *1. ECEI, Tohoku University, Sendai, Japan; 2. CSRN, Tohoku University, Sendai, Japan; 3. Toei Scientific Industrial Co., Ltd, Natori, Japan; 4. Division of Biomedical Engineering for Diagnosis and Treatment, Tohoku University, Sendai, Japan*

10:30

EF-11. **Modeling of thermally driven asymmetric oscillations in magnetoresistive readers.** T. Pipathanapoompron[1,2], M. d'Aquino[3], C. Serpico[4] and *A. Stankiewicz*[5] *1. Department of Electrical Engineering, Khon Kaen University, Khon Kaen, Thailand; 2. Seagate Technology, Korat, Thailand; 3. Department of Engineering, University of Naples "Parthenope", Naples, Italy; 4. Department of Electrical Engineering and Information Technology, University of Naples Federico II, Naples, Italy; 5. Seagate Technology, Bloomington, MN, United States*

10:42

EF-12. **Modeling Magnetoelectric Switching of the Exchange-Coupled G-type Antiferromagnet and Ferromagnet.** *Y. Liao*[1], D.E. Nikonov[2], S. Manipatruni[2], I. Young[2] and A. Naeemi[1] *1. Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, United States; 2. Components Research, Intel Corporation, Hillsboro, OR, United States*

10:54

EF-13. **Experimental evidence of the tunable nonlinearity in He^+ irradiated spin-torque nano-oscillators.** *S. Jiang*[1,2], S. Chung[1,3], T.Q. Le[1], L. Herrera Diez[4], A. Houshang[5], M. Zahedinejad[5], D. Ravelosona[4,6] and J. Åkerman[5,1] *1. Applied Physics, KTH Royal Institute Technology, Stockholm, Sweden; 2. NanOsc AB, Kista, Sweden; 3. Uppsala University, Uppsala, Sweden; 4. Center for Nanoscience and Nanotechnology, CNRS, Universite Paris-Sud, Paris, France; 5. Physics Department, University of Gothenburg, Gothenburg, Sweden; 6. Spin-Ion Technologies, Versailles Cedex, France*

11:06

EF-14. **Cavity Optomechanics of Topological Spin Textures in Magnetic Insulators.** *I. Proskurin*[1,2] and R. Stamps[1] *1. Physics & Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. Institute of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, Russian Federation*

11:18

EF-15. **Ultrafast Demagnetization by Extreme Ultraviolet Light.** *A. Philippi-Kobs*[1], M. Berntsen[2], L. Müller[1], M. Riepp[1], W. Roseker[1], K. Bagschik[1], J. Wagner[3], R. Frömter[3], F. Capotondi[4], E. Pedersoli[4], M. Kiskinova[4], M. Manfredda[4], M. Danailov[4], B. Ziaja[1], H. Oepen[3] and G. Grübel[1] *1. DESY, Hamburg, Germany; 2. KTH Royal Institute of Technology, Kista, Sweden; 3. University of Hamburg, Hamburg, Germany; 4. Elettra-Sincrotrone Trieste, Trieste, Italy*

THURSDAY MORNING 8:30 — WASHINGTON 1

Session EG
MAGNETIC IMAGING AND MEASUREMENT TECHNIQUES I

Emrah Turgut, Chair
Oklahoma State University, Stillwater, OK, United States

8:30

EG-01. **Electrically-induced topological phase transition and current-driven skyrmion motion in a chiral-lattice FeGe.** ***(Invited)*** *X. Yu*[1] *1. CEMS, RIKEN, Wako, Japan*

9:06

EG-02. **Quantitative magnetization measurements of Néel-type skyrmions, Bloch-type skyrmions and chiral bobbers using off-axis electron holography.** *A. Kovacs*[1], J. Caron[1], T. Denneulin[1], N.S. Kiselev[2], F. Zheng[1], Z. Li[3], M. Hoffmann[2], S. Blügel[2] and R.E. Dunin-Borkowski[1] *1. Ernst Ruska-Centre, Forschungszentrum Juelich, Juelich, Germany; 2. Peter Gruenberg Institute and Institute for Advanced Simulation, Forschungszentrum Juelich, Juelich, Germany; 3. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

9:18

EG-03. **Imaging Néel Skyrmions in permalloy nanodots induced by a magnetic field.** E. Berganza[1], M. Jaafar[1], M. Goiriena-Goikoetxea[2], J. Pablo-Navarro[3], J. Fernandez-Roldan[1], A. Garcia-Arribas[2], K. Guslienko[2], C. Magen[4], J. de Teresa[4], O. Chubykalo-Fesenko[1] and *A. Asenjo*[1] *1. ICMM-CSIC, Madrid, Spain; 2. UPV-EHU, Leioa, Spain; 3. Universidad de Zaragoza, Zaragoza, Spain; 4. ICMA-CSIC, Zaragoza, Spain*

9:30

EG-04. **Ultrafast Lorentz Microscopy: A tool to study laser- and current-driven magnetization dynamics.** *M. Möller*[1], N. Rubiano da Silva[1], J.H. Gaida[1], A. Feist[1], S. Schäfer[1] and C. Ropers[1] *1. 4th Physical Institute, University of Goettingen, Göttingen, Germany*

9:42

EG-05. **Crossover of Tip-sample Magnetic Couplings in an In-field Spin-polarized Scanning Tunneling Microscopy.** *S. Phark*[1,2] and D. Sander[3] *1. Center for Quantum Nanoscience, Institute for Basic Science, Seoul, The Republic of Korea; 2. Physics, Ewha Womans University, Seoul, The Republic of Korea; 3. Max-Planck-Institute of Microstructure Physics, Halle (Saale), Germany*

9:54

EG-06. **Investigation of Magnetostriction in Permalloy Thin Films using Lorentz Electron Microscopy.** *A.A. Cowan*[1,2] *1. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 2. Centre of Nanostructured Media, Queen's University, Belfast, United Kingdom*

10:06

EG-07. **Thin films magnetostriction measurements by scanning probe microscopy.** M. Coisson[1], M. Cialone[1,2], W. Huettenes[3], G. Barrera[1], F. Celegato[1], Z. Barber[3], P. Rizzi[2] and *P. Tiberto*[1] *1. Nanoscience and Materials, INRIM, Torino, Italy; 2. Chemistry, Università di Torino, Torino, Italy; 3. Materials science and metallurgy, University of Cambridge, Cambridge, United Kingdom*

10:18

EG-08. **An Apparatus and Methodology for High-power SQUID-detected Ferromagnetic Resonance Measurments.** *J.M. O'Reilly*[1] and P.S. Stamenov[1] *1. School of Physics and CRANN, Trinity College, Dublin, Ireland*

10:30

EG-09. **Investigating interlayer exchange coupling in FePt/MgO/CoFeB by ferromagnetic resonance.** *D. Tiwari*[1] *1. In-Situ Thin Film Lab, UGC-DAE-CSR Indore, Indore, India*

10:42

EG-10. **Real-Time Magnetometry by Tracked Magnetic Resonance of Nitrogen Vacancy Centers in Diamond.** *K. Ambal*[1,2] and R.D. McMichael[2] *1. Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, United States; 2. Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, MD, United States*

10:54

EG-11. **Study of thermally induced uniaxial anisotropy in nickel thin films by surface acoustic waves.** *S.A. Mathews*[1], N.A. Charipar[1] and K.M. Charipar[1] *1. Materials Science and Technology Division, US Naval Research Laboratory, Washington, DC, United States*

11:06

EG-12. **Development of a System for Low Temperature Optical Measurement of Three-Dimensional Magnon, Plasmon and Spin Torque Transfer Dynamics.** *Y. Ou*[1], X. Zhou[1], H. Kannan[2], R. Barri[2], S. Law[1], J. Xiao[2] and M.F. Doty[1] *1. Material Science and Engineering, University of Delaware, Newark, DE, United States; 2. Physics and Astronomy, University of Delaware, Newark, DE, United States*

THURSDAY MORNING 8:30 — WASHINGTON 2

Session EH

THIN FILMS AND SURFACE EFFECTS I

Melissa Loving, Chair

Northrop Grumman Corporation, Linthicum, MD, United States

8:30

EH-01. **Probing Chiral Ferrimagnetism in Amorphous GdCo Films.** ***(Invited)*** *R. Streubel*[1] *1. Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

9:06

EH-02. **Imaging the Magnetic Domain Structure of Cobalt Intercalated underneath Graphene on Silicon Carbide.** *R. Hönig*[1], P. Roese[1], K. Shamout[1], T. Ohkochi[3], U. Berges[2,1] and C. Westphal[1] *1. TU Dortmund University, Dortmund, Germany; 2. Zentrum für Synchrotronstrahlung, Dortmund, Germany; 3. Japan Synchrotron Radiation Research Institute, Sayo-gun, Japan*

9:18

EH-03. **Reversal processes in CoCrPt thin films and pseudo-spin-valves with perpendicular magnetic anisotropy.** *D. Navas*[1], F. Beron[2], C.T. Sousa[1], M. Puydinger[2], K.R. Pirota[2], N. Soriano[3], C. Redondo[3], R. Morales[4,5] and C. Ross[6] *1. IFIMUP-IN and Departamento de Física e Astronomia, Universidade do Porto, Porto, Portugal; 2. Instituto de Fisica Gleb Wataghin, Universidade Estadual Campinas, Campinas, Brazil; 3. Department of Chemical-Physics, University of the Basque Country UPV/EHU, Leioa, Spain; 4. Department of Chemical-Physics & BCMaterials, University of the Basque Country UPV/EHU & BCMaterials, Leioa, Spain; 5. IKERBASQUE, Basque Foundation for Science, Bilbao, Spain; 6. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

9:30

EH-04. **Enhancement of Perpendicular Magnetic Anisotropy in Epitaxial $Co_{50}Fe_{50}$(110)/Pt(111) Films on $MgAl_2O_4$(001).** *A.J. Lee*[1], A. Ahmed[1], S. Guo[1] and F. Yang[1] *1. Physics, The Ohio State University, Columbus, OH, United States*

9:42

EH-05. **Interfacial perpendicular magnetic anisotropy in Fe/$MgAl_2O_4$: A first-principles and experimental study.** *K. Masuda*[1], Q. Xiang[1,2], H. Sukegawa[1], S. Mitani[1,2] and Y. Miura[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan*

9:54

EH-06. **Withdrawn**

10:06

EH-07. **MnBi Thin and Ultra-thin Films for High Temperature Permanent Magnet Applications.** *M. Villanueva*[1], C. Navío[1], J. Rial[1], E. Céspedes[1], F.J. Mompean[2], M. García-Hernández[2], J. Camarero[1,3] and A. Bollero[1] *1. IMDEA Nanoscience, Madrid, Spain; 2. ICMM-CSIC, Madrid, Spain; 3. UAM, Madrid, Spain*

10:18

EH-08. **Thin Film Rare Earth Iron Garnets with Perpendicular Magnetic Anisotropy for Spintronic Applications.** S. Mokarian Zanjani[1] and *M.C. Onbasli*[1,2] *1. Graduate School of Materials Science and Engineering, Koc University, Istanbul, Turkey; 2. Electrical and Electronics Engineering, Koc University, Istanbul, Turkey*

10:30

EH-09. **Investigation of different Growth Modes of epitaxial EuS grown on InAs.** *N.V. Blümel*[1], A. Goschew[1], Y. Shokr[1] and P. Fumagalli[1] *1. Experimental Physics, Freie Universität Berlin, Berlin, Germany*

10:42

EH-10. **Engineering and monitoring spin states: From antiferromagnetic thin films to spin-crossover molecules.** *A.T. N'Diaye*[1], X. Zhang[3], P.S. Costa[3], G. Hao[3], M. Yang[2], Q. Li[2], Z. Qiu[2], P.S. Dowben[3] and E. Arenholz[1] *1. Advanced Light Source, Lawrence Berkeley National Lab, Berkeley, CA, United States; 2. Department of Physics, University of Califonria, Berkeley, Berkeley, CA, United States; 3. Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States*

10:54

EH-11. **Ferromagnetic Interlayer Exchange Coupling in Py/Pt/Py.** *P. Omelchenko*[1], B. Heinrich[1] and E. Girt[1] *1. Physics, Simon Fraser University, Burnaby, BC, Canada*

11:06

EH-12. **Preparation and Characterization of Sputtered Fe_3O_4 Thin Film.** *L. Cao*[1], Z. Huang[1], J. Liang[1], X. Zhou[1], Y. Zhai[1,2], J. Du[2] and B. You[2] *1. School of Physics, Southeast University, Nanjing, China; 2. National Laboratory of Solid Microstructures, Nanjing University, Nanjing, China*

11:18

EH-13. **Investigating the role of island formation on the mediation of strain and magnetic properties of ultra-thin film FeRh using PNR.** *C. Bull*[1], C. Barton[1], W. Griggs[1], A. Caruana[2], C. Kinane[2], P. Nutter[1] and T. Thomson[1] *1. Nano Engineering and Storage Technology Research Group, School Of Computer Science, University Of Manchester, Manchester, United Kingdom; 2. ISIS, Harwell Science and Innovation Campus, Science and Technology Facilities Council, Rutherford Appleton Laboratory, Didcot, United Kingdom*

THURSDAY MORNING 8:30 | WASHINGTON 5

Session EI
NEW AND NANOSTRUCTURED PERMANENT MAGNETS I

Mahmud Khan, Co-Chair
Miami University, Oxford, OH, United States
Balamurugan Balasubramanian, Co-Chair
University of Nebraska, Lincoln, NE, United States

8:30

EI-01. **Phase-tuning control in MnAl gas atomized powder by nanostructuring through flash-milling process.** *J. Rial*[1], P. Švec[2], E. Palmero[1], P. Švec Sr[2] and A. Bollero[1] *1. Division of Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain; 2. Institute of Physics, Slovak Academy of Sciences, Bratislava, Slovakia*

8:42

EI-02. ***In-situ* observation of the ferromagnetic $L1_0$ phase formation in the Mn-Al-C rapidly solidified alloy by synchrotron X-ray diffraction.** *A. Pasko*[1], V. Etgens[1], M. Tyrman[1], F. Mazaleyrat[1], A. Vlad[2], Y. Garreau[2], A. Coati[2], M. Sauvage-Simkin[2], S. Quetel-Weben[3], L. Perrière[3] and I. Guillot[3] *1. SATIE, ENS Paris-Saclay, CNRS, Cachan, France; 2. Synchrotron SOLEIL, CNRS, Gif-sur-Yvette, France; 3. ICMPE, UPEC, CNRS, Thiais, France*

8:54

EI-03. **A Novel Approach for Rare Earth Free Hf-Co Permanent Magnet.** I. Singh[2], *M. Palit*[1] and R. Mathur[1] *1. Advanced Magnetics Group, Defence Metallurgical Research Laboratory, Hyderabad, India; 2. Dept. Of Mechanical Engg, National Institute of Technology, Calicut, Calicut, India*

9:06

EI-04. **The core-shell engineering on energy product of magnetic nanometals.** ***(Invited)*** *S. Ren*[1] *1. University at Buffalo, The State University of New York, Buffalo, NY, United States*

9:42

EI-05. **Magnetic Property Enhancement of High-Field-Annealed Rapidly-Quenched MnBi Due to Sn Addition.** *W. Zhang*[1,2], R. Skomski[1,2], P.R. Kharel[3], L. Yue[1] and D.J. Sellmyer[1,2] *1. Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, United States; 2. Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, United States; 3. Department of Physics, South Dakota State University, Brookings, SD, United States*

9:54

EI-06. **Novel fabrication processing of MnBi powder and magnets with high performance.** *W. Tang*[1], G. Ouyang[1,2], B. Jensen[1], B. Cui[1], K.W. Dennis[1] and J. Cui[1,2] *1. Ames Laboratory of USDOE, Ames, IA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States*

10:06

EI-07. **Neutron diffraction study of $Fe_{3+x}Co_{3-x}Ti_2$ (x=0, 2, 3).** *H. Wang*[1], B. Balasubramanian[1,3], R. Pahari[1], Y. Liu[2], A. Huq[2], D.J. Sellmyer[1,3] and X. Xu[1,3] *1. Physics and Astronomy, University of Nebraska - Lincoln, Lincoln, NE, United States; 2. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 3. Nebraska Center for Materials and Nanoscience, Lincoln, NE, United States*

10:18

EI-08. **Hierarchical Lengthscales and Coercivity in Exchange-Coupled Nanochessboards.** E. Vetter[1], L. Geng[2], W. Jensen[1], M. Phillips[1], D. Joo[1], W. Soffa[1], Y. Jin[2] and *J. Floro*[1] *1. Materials Science and Engineering, University of Virginia, Charlottesville, VA, United States; 2. Materials Science and Engineering, Michigan Technological University, Houghton, MI, United States*

10:30

EI-09. **Thick On-chip Hard Magnets Having Excellent Performance for MEMS Applications.** *Y. He*[1], B. Chen[2], S. Haider[2], M. Zaeimbashi[1], C. Yu[1], G.M. Stephen[3], D. Heiman[3], Y. Wei[1], H. Chen[1], X. Liang[1], C. Tu[1], C. Dong[1], Y. Zhang[1] and N.X. Sun[1] *1. Department of Electrical and Computer Enginnering, Northeastern University, Boston, MA, United States; 2. Analog Devices, Inc., Wilmington, MA, United States; 3. Department of Physics, Northeastern University, Boston, MA, United States*

10:42

EI-10. **Large coercive field of ruthenium substituted ε-iron oxide nanomagnet.** *A. Namai*[1] and S. Ohkoshi[1] *1. The University of Tokyo, Tokyo, Japan*

10:54

EI-11. **Chemical Synthesis of Metal-Substituted Epsilon Iron Oxide and Preparation of Magnetically Oriented Films.** *M. Yoshikiyo*[1], A. Namai[1] and S. Ohkoshi[1] *1. Department of Chemistry, School of Science, The University of Tokyo, Tokyo, Japan*

11:06

EI-12. **Magnetically Oriented Barium Hexaferrite Thick Films Deposited by Aerosol Deposition with *in situ* Magnetic Field.** *S.D. Johnson*[1], D. Park[2], S. Shin[1], S. Qadri[1] and E. Gorzkowski[1] *1. Naval Research Laboratory, Washington, DC, United States; 2. Korean Institute of Material Science, Changwon, The Republic of Korea*

11:18

EI-13. **Theoretical and Computational Discovery of Critical Element Reduced Permanent Magnet Materials.** *D. Paudyal*[1] and R. Choudhary[1] *1. Ames Laboratory, Ames, IA, United States*

THURSDAY
MORNING
9:30

EXHIBIT HALL A

Session EJ
NANOPARTICLES AND NANOWIRES (Poster Session)
Karine Chesnel, Chair
Brigham Young University, Provo, UT, United States

EJ-01. **Quantitative size-structure-magnetic property relationships in thoroughly-characterized metallic Ni nanoparticle assemblies.** *J.T. Batley*[1], M. Nguyen[1], I. Kamboj[1], C. Leighton[1] and E. Aydil[1] *1. Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

EJ-02. **Self-assembly of magnetic nanoparticles on magnetically recorded templates with sub-100 nm feature sizes.** *A.R. Mohtasebzadeh*[1,2], E. Vreeland[3] and T. Crawford[1,2] *1. SmartState Center for Experimental Nanoscale Physics, University of South Carolina, Columbia, SC, United States; 2. Physics and Astronomy, University of South Carolina, Columbia, SC, United States; 3. IR Dynamics, LLC, Albuquerque, NM, United States*

EJ-03. **Properties of Magnetic Nanofibers under Different Growth Conditions.** *K. Gao*[1], Y. Zhang[1], Y. Xie[1], B. Kucukgok[1] and J. Wang[2] *1. Applied Materials Division, Argonne National Laboratory, Argonne, IL, United States; 2. Nanoscience and Technology, Argonne National Laboratory, Argonne, IL, United States*

EJ-04. **Bloch point states in arrays of dipole-coupled magnetic nanodots and effects of magnetic frustration.** *I. Nekrashevich*[1] and D. Litvinov[1,2] *1. Electrical and Computer Engineering, University of Houston, Houston, TX, United States; 2. Nanofabrication Facility, University of Houston, Houston, TX, United States*

EJ-05. **Studies on the Magnetism of Well Conformed Sets of Nanoparticles.** *L.M. Socolovsky*[6,1], P.C. Rivas Rojas[3,2], P. Tancredi[3,4] and O. Moscoso Londoño[5] *1. CIT Santa Cruz, CONICET, Río Gallegos, Argentina; 2. Facultad de Ingenieria, Universidad de Buenos Aires, Buenos Aires, Argentina; 3. CONICET, San Martín, Argentina; 4. Instituto Nacional de Tecnología Industrial, San Martín, Argentina; 5. Universidad Autónoma de Manizales, Manizales, Colombia; 6. UTN FRSC, Rio Gallegos, Argentina*

EJ-06. **Magnetic properties of flexible nanofibers modulated by far-field electrospinning.** *C. Li*[1], B. Chen[1], Y. He[1], H. Huang[2] and Z. Wei[2] *1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. Nanoengineering and Microsystems, National Tsing Hua University, Hsinchu, Taiwan*

EJ-07. **Magnetic Nanowires Grown with Directed Electrochemical Nanowire Assembly.** J. Samba[1], S. Pokharel[1], A. Lisfi[1] and *B. Ozturk*[1] *1. Physics and Engineering Physics, Morgan State University, Baltimore, MD, United States*

EJ-08. **Challenge to the synthesis of α″-(Fe, Co)$_{16}$N$_2$ nanoparticles obtained by hydrogen reduction and subsequent nitrogenationstarting from α-(Fe, Co)OOH.** *M. Tobise*[1], S. Saito[1] and M. Doi[2] *1. Electronic Engineering, Tohoku Universsity, Sendai, Japan; 2. Electronic Engineering, Tohoku Gakuin University, Tagajo, Japan*

EJ-09. **Investigation on Synthesis of Fe_3O_4@nSiO_2@mSiO_2 Hybrid Particles and Peroxidation.** *Y. Zhu*[1], Z. Kou[1], W. Chao[1], S. Yuan[1], Z. Huang[1], X. Zhou[1], L. Cao[1], Y. Zhai[1,2], B. You[2] and J. Du[2] *1. School of Physics, Southeast University, Nanjing, China; 2. National Laboratory of Solid Microstructures, Nanjing University, Nanjing, China*

EJ-10. **Temperature dependence of magnetic first-order reversal curves for hollow Fe_3O_4 submicron particles.** *M. Chiba*[1], S. Kobayashi[1], T. Murakami[1] and J. Manjanna[2] *1. Iwate University, Morioka, Japan; 2. Rani Channamma, Belgavi, India*

EJ-11. **Detection of compositional change in magnetic nanowire by FMR; A non-invasive technique.** *S. Aslam*[1,2], A. Das[1], M. Khanna[2] and B.K. Kuanr[1] *1. Special Centre for Nanoscience, Jawaharlal Nehru University, Delhi, India; 2. Electronic Science Department, University of Delhi, Delhi, India*

EJ-12. **Parametric Amplification of Reversible Transverse Magnetic Susceptibility in Oriented Single Domain Magnetic Nanoparticles.** M. Barbic[2], R. Smith[2] and *H. ElBidweihy*[1] *1. Electrical and Computer Engineering Department, United States Naval Academy, Annapolis, MD, United States; 2. Applied Physics and Instrumentation Group, Howard Hughes Medical Institute - Janelia Research Campus, Ashburn, VA, United States*

Session EK
ENERGY ASSISTED MAGNETIC RECORDING II (Poster Session)

Yukiko Takahashi, Chair
NIMS, Tsukuba, Japan

EK-01. **Theoretical Investigation of Intersystem Crossing for All-Optical Switching.** Y. Zou[1], H. Wang[1], K. Wang[2], W. Cheng[3], *Z. Zeng*[1], Y. Xiao[1] and C. Xie[1] *1. Wuhan National Laboratory for Optoelectronics, Wuhan, China; 2. School of Physics, Huazhong University of Science and Technology, Wuhan, China; 3. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*

EK-02. **Thermodiffusion phenomena of the functional polymer lubricants for the heat-assisted magnetic recording.** *P. Chung*[1] and H. Park[1] *1. Energy Engineering, Inje University, Gimhae, The Republic of Korea*

EK-03. **Control of Nucleation and Coarsening at Initial Stage during Film Growth of FePt-C Granular Films.** *I. Suzuki*[1], J. Wang[1], Y. Takahashi[1] and K. Hono[1] *1. National Institute for Materials Science, Tsukuba, Japan*

EK-04. **High melting point metal (Pt, W, Ir) as seed layer for grain size control of FePt based heat-assisted magnetic recording media.** J. Wang[1], D. Liu[2], *I. Suzuki*[3], Y. Takahashi[3] and K. Hono[3] *1. International Center for Young Scientists, National Institute For Materials Science, Tsukuba, Japan; 2. School of Materials Science and Engineering, Zhejiang University, Hangzhou, China; 3. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan*

EK-05. **The network-shaped upheaval structure in (002) textured MgO layer for $L1_0$ FePt-based granular media with columnar nanostructure.** *A. Shimizu*[1], S. Hinata[1], S. Jo[1] and S. Saito[1] *1. Tohoku Univ., Sendai, Japan*

EK-06. **Microwave-assisted magnetization reversal in dispersed nano-sized barium ferrite particles.** *E. Ozawa*[1] *1. FUJIFILM Corporation, ODAWARA-SHI, Japan*

EK-07. **Optimisation of dual structure recording media for microwave assisted magnetic recording.** *S. Greaves*[1], K.S. Chan[3] and Y. Kanai[2] *1. RIEC, Tohoku University, Sendai, Japan; 2. Dept. of Engineering, Niigata Institute of Technology, Kashiwazaki, Japan; 3. Nanjing Institute of Technology, Nanjing, China*

EK-08. **Correction of transition curvature for shingled, heat assisted magnetic recording.** *S. Greaves*[1], R. Itagaki[2] and Y. Kanai[2] *1. RIEC, Tohoku University, Sendai, Japan; 2. Dept. of Engineering, Niigata Institute of Technology, Kashiwazaki, Japan*

EK-09. **Large Uniaxial Anisotropy $Co_{50}(Pt_{1-x}Rh_x)_{50}$ Thin Films for Microwave Assisted Magnetic Recording.** *D. Kumar*[1], T. Jin[1], V. Chaudhary[1], K. Tham[2], S. Saito[2] and S. Piramanayagam[1] *1. Division of Physics and Applied Physics, Nanyang Technological University, Singapore, Singapore; 2. Department of Electronic Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan*

EK-10. **The critical frequency for microwave-assisted magnetization switching in exchange coupled composite medium.** *H. Tatsuno*[1], S. Suzuki[1], S. Kasai[2] and Y. Nozaki[1,3] *1. Department of Physics, Keio Univ., Yokohama, Japan; 2. National Institute for Material Science, Tsukuba, Japan; 3. Center for Spintronics Research Network, Keio Univ., Yokohama, Japan*

THURSDAY MORNING 9:30 — EXHIBIT HALL A

Session EL
MAGNETISM IN HEUSLER ALLOYS (Poster Session)

Patrick Quarterman, Chair
NIST Center for Neutron Research, Gaithersburg, MD, United States

EL-01. **Electric-field modulation of magnetism in Heusler CoFeMnSi thin film.** *H. Fu*[1], C. You[1], L. Ma[1] and N. Tian[1] *1. School of Materials Science and Engineering, Xi'an University of Technology, Xi'an, China*

EL-02. **Al substitution effects on phase stabilities and magnetic properties of tetragonal Mn_3Ge.** *H. Okada*[1,2] and Y. Shoji[2] *1. Faculty of Engineering, Tohoku Gakuin University, Tagajo, Japan; 2. Graduate School of Engineering, Tohoku Gakuin University, Tagajo, Japan*

EL-03. **Experimental and theoretical investigations of half metallic $Co_{2-x}Fe_xCrAl$ (x = 0.25, 0.50 and 0.75) Heusler alloys.** *A.K. Patel*[1], L. Bainsla[2], V. Yenugonda[1] and K.G. Suresh[1] *1. Department Of Physics, Indian Institute of Technology Bombay, Mumbai, India; 2. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan, Sendai, Japan*

EL-04. **Theoretical prediction of new quaternary Heusler alloys having high Curie temperatures and high spin polarizations with the aid of machine learning.** *T. Kanemura*[1], T. Roy[1], M. Tujikawa[1,2] and M. Shirai[1,2] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

EL-05. **Magnetic Critical Behavior and Magneto-Caloric Effect in $Mn_{50}Ni_{41-x}Fe_xSn_9$ Heusler Alloys.** *A. Rosales-Rivera*[1], N. Salazar-Henao[1], R. González-Sánchez[1], A. Velásquez-Salazar[1], J. López-Tabares[1] and F. Saccone[2] *1. Laboratorio de Magnetismo y Materiales Avanzados, Universidad Nacional de Colombia, Sede Manizales, Manizales, Colombia; 2. Departamento de Física, Facultad de Ingeniería, Universidad de Buenos Aires, Buenos Aires, Argentina*

EL-06. **Magnetic coupling in $Ni_{49}Mn_{36}In_{15}$ Heusler alloy.** *V. Franco*[1], J. Law[1], A. Conde[1], A. Giri[2], F. Schulz[3], M. Huang[3], F. Gross[3], M. Weigand[3], G.A. Schütz[3], E.J. Goering[3] and J. Gräfe[3] *1. Universidad de Sevilla, Sevilla, Spain; 2. Weapons and Materials Research Directorate, US Army Research Laboratory, Aberdeen, MD, United States; 3. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

EL-07. **Fabrication of metastable B2-type $Fe_{1-x}Sn_x$ epitaxial films on MgO(001) substrates.** *Y. Goto*[1], M. Araki[1], N. Takahashi[1], T. Yanase[2], T. Shimada[2], M. Tsujikawa[3,4], M. Shirai[3,4], A. Kamimaki[5,6], S. Iihama[5], S. Mizukami[4,7] and T. Nagahama[2] *1. Graduate School of Chemical Sciences and Engineering, Hokkaido University, Sapporo, Japan; 2. Graduate School of Engineering, Hokkaido University, Sapporo, Japan; 3. Research Institute of Electrical Communication (RIEC), Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network (CSRN), Tohoku University, Sendai, Japan; 5. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 6. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 7. Center for Science and Innovation in Spintronics (Core Research Cluster), Tohoku University, Sendai, Japan*

EL-08. **Structure and magnetism of $NiFeMnGa_xSn_{1-x}$ (x = 0, 0.25, 0.5, 0.75, 1) Heusler alloys.** J. Waybright[1], L. Halbritter[1], *B.R. Dahal*[1], H. Qian[1,2], P. Lukashev[3], Y. Huh[1] and P.R. Kharel[1] *1. Department of Physics, South Dakota State University, Brookings, SD, United States; 2. Material Science and Engineering, Changzhou University, Changzhou, China; 3. Department of Physics, University of Northern Iowa, Cedar Falls, IA, United States*

EL-09. **Structural stabilities and magnetic characteristics of Heusler alloys Fe_2MnGa.** *M. Ono*[1], H. Okada[1,2], M. Doi[1,2] and S. Awaji[3] *1. Graduate School of Engineering, Tohoku Gakuin University, Tagajo 985-8573, Japan; 2. Faculty of Engineering, Tohoku Gakuin University, Tagajo 985-8573, Japan; 3. High Field Laboratory for Superconducting Materials, IMR, Tohoku University, Sendai 980-8577, Japan*

EL-10. **Impact of atomic ordering on anomalous Nernst effect in Co_2MnGa thin film.** *Y. Sakuraba*[1,2], K. Hyodo[3], S. Mitani[1], K.R. Loku Singgappulige[4], H. Tajiri[4], T. Nakatani[1] and A. Sakuma[3] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. PRESTO, Japan Science and technology Agency (JST), Saitama, Japan; 3. Tohoku University, Sendai, Japan; 4. Japan Synchrotron Radiation Research Institute, Sayo, Japan*

Session EM
MAGNETO-CALORIC MATERIALS III
(Poster Session)
Manh-Huong Phan, Chair
University of South Florida, Tampa, FL, United States

EM-01. **Withdrawn**

EM-02. **Electronic structure and magnetic properties of gadolinium-based intermetallic compounds from ab initio calculations accounting for electronic correlations.** *A. Lukoyanov*[1,2], Y. Knyazev[1], Y. Kuz'min[1], S. Samatham[4,3] and K.G. Suresh[4] *1. M.N. Miheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences (IMP UB RAS), Yekaterinburg, Russian Federation; 2. Ural Federal University, Yekaterinburg, Russian Federation; 3. Department of Physics, Maharaj Vijayaram Gajapathi Raj College of Engineering, Vizianagaram, India; 4. Department of Physics, Indian Institute of Technology Bombay, Mumbai, India*

EM-03. **Effect of Training on the Magnetic Hysteresis in $Gd_5Si_2Ge_2$.** *Y. Mudryk*[1] and V.K. Pecharsky[1,2] *1. Ames Laboratory, Iowa State University, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

EM-04. **Mechanical and magnetocaloric properties of $La(Fe,Mn,Si)_{13}H_y$ plates prepared by metal-binding prior to hydrogenation.** Y. Li[1], *F. Hu*[1], J. Wang[1], J. Hao[1], F. Shen[1], J. Sun[1] and B. Shen[1] *1. Institution of Physics, Beijing, China*

EM-05. **Magnetocaloric Effect of Nano and Micro particles of $La(Fe_xCo_ySi_{1-x-y})_{13}$.** *K. Javed*[1], B. Williams[1], S. Gupta[2], V.K. Pecharsky[2,3] and R.L. Hadimani[1] *1. Dept. of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Division of Materials Science and Engineering, Ames Laboratory, Ames, VA, United States; 3. Department of Materials Science and Engineering, Iowa State University, Ames, VA, United States*

EM-06. **Magnetocaloric properties of $GdVO_4$ nanoparticles synthesized by microwave-assisted hydrothermal methods.** *S. Ryu*[1], J. Lee[2], M. Song[2], B. Cho[2] and C. Nam[1] *1. Photonics and Sensors, Hannam University, Daejeon, The Republic of Korea; 2. Materials Science and Engineering, Gwanju Institute of Science and Technology, Gwangju, The Republic of Korea*

EM-07. **Enhancement of magnetocaloric effect driven by hydrostatic pressure in HoCuSi compound.** *J. Hao*[1,2], F. Liang[1,3], Y. Liu[1,3], J. He[2], J. Wang[1,3], F. Hu[1,3], J. Sun[1,3] and B. Shen[1,3] *1. Beijing National Laboratory for Condensed Matter Physics & State Key Laboratory of Magnetism, Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Division of Functional Material Research, Central Iron and Steel Research Institute, Beijing, China; 3. School of Physical Sciences, University of Chinese Academy of Sciences, Beijing, China*

EM-08. **Magnetocaloric effect in rare earth Ho_2O_3 nanopowder at cryogenic temperature regime.** *K.P. Shinde*[1], M.V. Tien[1], L. Huang[1], H.R. Park[1], S. Yu[1], K. Chung[2] and D. Kim[1] *1. Department of Physics, Chungbuk National University, Cheongju, The Republic of Korea; 2. Functional Materials Department, Korea Institute of Material Science, Changwon, The Republic of Korea*

EM-09. **Interstitial effects on the magnetic phase transition and magnetocaloric effects in (Hf, Ta)Fe_2 Kagome phase.** Y. Yang[1], C. Tian[1], X. Fan[2], X. Yin[2], *Q. Xiang*[3], W. Cui[1,2] and Q. Wang[1] *1. Northeastern University, Shenyang, China; 2. Northwestern Polytechnical University, Xi'an, China; 3. National Institute for Materials Science, Tsukuba, Japan*

EM-10. **Criitical behavior and magnetocaloric effect in $La_{0.7}Ba_{0.25}Nd_{0.05}Mn_{1-x}Cu_xO_3$.** *M.V. Tien*[1], K. Shinde[1], D. Nanto[3], L. Huang[1], D. Pham[1], K. Chung[2], S. Yu[1] and D. Kim[1] *1. Physics, Chungbuk National University, Cheongju, The Republic of Korea; 2. Functional Materials Department, Korea Institute of Materials Science, Changwon, The Republic of Korea; 3. Physics Education, Syarif Hidayatullah State Islamic University, Jakarta, Indonesia*

THURSDAY MORNING 9:30 — EXHIBIT HALL A

Session EN
SOFT MAGNETIC COMPONENTS: TRANSFORMERS AND INDUCTORS II (Poster Session)
Pilar Marin, Chair
Universidad Complutense de Madrid, Madrid, Spain

EN-01. **Finite Element Analysis of Epoxy Cast Dry Transformer Considering Core Rotational Loss.** *C. Zhang*[1], X. Yan[1] and Y. Li[1] *1. Hebei University of Technology, Tianjin, China*

EN-02. **Effect of Specimen Shape on Eddy Current Distribution in Large Single Sheet Tester.** *Y. Li*[1], Y. Dou[1], C. Zhang[1], S. Yue[1] and K. Zhang[1] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

EN-03. **Research on the Squeeze Current Effect of the Foil-type Excitation Windings under the Condition of High Frequency.** M. Yang[1,2], *Y. Li*[1,2], C. Zhang[1,2] and Q. Yang[1,3] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 3. Tianjin Key Laboratory of AEEET, Tianjin Polytechnic University, Tianjin, China*

EN-04. **Parameter Estimation of Extended Jiles–Atherton Hysteresis Reactor for Transformer Modeling Based on ISFLA.** *M. Zou*[1,2], Y. Qiu[3] and P. Duan[1,2] *1. College of Automation, Chongqing University of Posts and Telecommunications, Chongqing, China; 2. Key Laboratory of Industrial Internet of Things and Networked Control, Ministry of Education, Chongqing University of Posts and Telecommunications, Chongqing, China; 3. Chongqing Architectural Design Institute, Chongqing, China*

EN-05. **3-D Coupled Magnetic-Fluid-Thermal Analysis of Single-phase Potential Transformer Under Overvoltage Condition.** *S. Feng*[1] and S. Wang[1] *1. Xi'an Jiaotong University, Xi'an, China*

EN-06. **Reduction of Magnet Eddy Current Loss in PMSM by using Partially Magnet Segment Method.** *J. Ma*[1,2], Y. Wang[1,2], C. Liu[1,2], G. Lei[3], Y. Guo[3] and J. Zhu[5] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment(School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province(School of Electrical Engineering, Hebei University of Technology), Tianjin, China; 3. University of Technology Sydney, Sydney, NSW, Australia; 5. University of Sydney, Sydney, NSW, Australia*

EN-07. **Numerical and Experimental Validation of Cooling Performance in Vegetable Insulating Oil-Based Ferrofluid with Different Volume Fractions.** *H. Lee*[1] *1. Changshin University, Changwon-si, The Republic of Korea*

EN-08. **Transient Electromagnetic Field and Mechanical Stress Coupled Simulation for Fast Linear Transformer Driver.** H. Qiu[1], *S. Wang*[1], Y. Huangfu[1], S. Wang[1], S. Wang[1] and T. Zhu[1] *1. School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China*

EN-09. **Research on Dynamic Characteristics of Transformer Windings Using Optical Fiber Measurement System and High-speed Camera.** S. Wang[1], *S. Wang*[1], H. Qiu[1], N. Zhang[1] and D. Yuan[1] *1. National State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China*

EN-10. **Impact of magnetostriction of core loss and noise on numerous capacity of no-load power transformer.** *C. Hsu*[1] and M. Hsieh[2] *1. Department of Mechanical Engineering, Oriental Institute of Technology, New Taipei, Taiwan; 2. Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan*

Session EO
ACTUATION
(Poster Session)

Atsushi Yao, Chair
Toyama Prefectural University, Imizu, Japan

EO-01. **Harmonic induced magnetism distortion caused by AC and DC composited power for dc motor device.** *C. Hsu*[2] and M. Hsieh[1] *1. Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan; 2. Department of Mechanical Engineering, Oriental Institute of Technology, New Taipei, Taiwan*

EO-02. **Cableless magnetic actuator capable of high-speed transport in a curved pipe.** *H. Yaguchi*[1], Y. Konno[1] and H. Sano[1] *1. Tohoku Gakuin University, Tagajo, Japan*

EO-03. **A Novel Modular Vernier Reluctance Machine Excited by Zero Sequence Current for In-Wheel Vehicle Propulsion.** *X. Zhao*[1] and S. Niu[1] *1. The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

EO-04. **Comparison of Electromagnetic Characteristics of Short Stroke Linear Oscillating Actuators with Rare-Earth and Ferrite Magnets.** *C. Kim*[1], G. Jang[1], S. Jeong[2] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeion, The Republic of Korea; 2. LG Electronics, Seoul, The Republic of Korea*

EO-05. **Research on Temperature Rise and Temperature Control for Ultrasonic Giant Magnetostrictive Transducer.** *Y. Li*[1], W. Huang[1], B. Wang[1] and C. Gao[1] *1. Hebei University of Technology, Tianjin, China*

EO-06. **The Design and Output Characteristics of Ultrasonic Transducer Based on Rare-earth Giant Magnetostrictive Material.** *Y. Li*[1], W. Huang[1] and B. Wang[1] *1. Hebei University of Technology, Tianjin, China*

EO-07. **Design of Switchable Magnetic Wheel for Mobile Robots.** *M.D. Noh*[1], E. Kwon[1], S. Park[1] and Y. Park[1] *1. Mechatronics Engineering, Chungnam National University, Daejeon, The Republic of Korea*

EO-08. **Detent Force and Static Force Experimental Analysis of a 3 kW Single-Phase Linear Permanent Magnet Generator for Stirling Engines.** *K. Lee*[1], S. Lee[1], J. Park[1] and J. Choi[2] *1. EV Components & Materials Group, Korea Institute of Industrial Technology, Gwangju, The Republic of Korea; 2. Department of Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea*

EO-09. **A Novel Mover-separated Fast Permanent Magnet Actuator for 10kV Vacuum Circuit Breaker.** H. Ni[1], S. Fang[1], H. Lin[1] and *Z. Pan*[1] *1. Southeast University, Nanjing, China*

Session EP
SOFT MAGNETIC MATERIALS V: AMORPHOUS AND NANOCRYSTALLINE MATERIALS (Poster Session)

Qifan Li, Chair
Northeastern University, Boston, MA, United States

EP-01. **Enhancement of Magnetic and Surface Properties in Magneto-electrodeposited FePd Alloy Thin films.** *S. Annamalai*[1] and J. Mohanty[1] *1. Department of Physics, Indian Institute of Technology, Hyderabad, Hyderabad, India*

EP-02. **Withdrawn**

EP-03. **Current controlled longitudinal magnetization switching in glass coated microwires.** S. Corodeanu[1], *H. Chiriac*[1], N. Lupu[1] and T.A. Ovari[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

EP-04. **Characterization of Magnetic Properties of Nanocrystalline Alloys under Rotational Magnetization.** *L. Chen*[1], T. Ben[1], C. Fang[1], H. Zhao[2], C. Liu[2] and Y. Wang[2] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

EP-05. **Production of nanocrystalline soft magnetic powders with high *Bs* by an improved rapid-cooling water-atomization process.** K. Yoshida[1], *T. Takahashi*[1] and H. Kuwata[1] *1. Tohoku Magnet Institute Co., Ltd., Sendai, Japan*

EP-06. **Magnetically Controlled Electrical Properties of Amorphous $Fe_{(85-x)}Co_xTi_7Hf_6B_2$ Alloys.** C. Chen[1], L. Huang[2], S. Kim[3], X. Ma[1], *H. Piao*[1,2], H. Yim[3] and D. Kim[2] *1. Research Institute for Magnetoelectronics & Weak Magnetic-field Detection, College of Science, China Three Gorges University, Yichang, China; 2. Chungbuk National University, Cheongju, The Republic of Korea; 3. Physics, Sookmyung Women's University, Seoul, The Republic of Korea*

EP-07. **Si effects on a thermal stability and a crystallization behavior of P-riched Fe(-Si)-B-P-Cu alloys.** *T. Tomita*[1], T. Takahashi[1] and H. Kuwata[1] *1. Tohoku Magnet Institute Co., Ltd., Sendai, Japan*

EP-08. **Interplay between magnetic ion and amorphous carbon in $Na_3V_2(PO_4)_3$/C nanocomposite.** C. Kao[1], *C. Yang*[1], C. Wang[2], Y. Tung[1], T. Hsu[1], W. Wu[1], S. Zhuang[3] and W. Liu[3] *1. Physics, Chung Yuan Christian University, Taoyuan, Taiwan; 2. National Synchrotron Radiation Research Center, Hsinchu, Taiwan; 3. Chemical Engeneering, Chung Yuan Christian University, Taoyuan, Taiwan*

EP-09. **Correlation between the structural and magnetic characteristics of $Fe_{73.5}Cu_1Nb_3Si_{13.5}B_9$ glass-coated nanowires.** *T.A. Ovari*[1], G. Ababei[1], S. Corodeanu[1], H. Chiriac[1] and N. Lupu[1] *1. Department of Magnetic Materials and Devices, National Institute of Research and Development for Technical Physics, Iasi, Romania*

THURSDAY MORNING 9:30 — EXHIBIT HALL A

Session EQ
MOTORS: CONTROL AND DRIVES (Poster Session)

Jonathan Bird, Chair
Portland State University, Portland, OR, United States

EQ-01. **Research on Common Mode Current and Electromagnetic Radiation in PWM Motor System.** *F. Niu*[1,2], S. Cao[1], X. Huang[2], K. Li[1] and Y. Fang[2] *1. Hebei University of Technology, Tianjin, China; 2. Zhejiang University, Hangzhou, China*

EQ-02. **A Multi-Vector-Based Model Predictive Control with Geometric Method of Five-Phase Flux-Switching Permanent Magnet Motor.** W. Hua[1], *F. Chen*[1] and W. Huang[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

EQ-03. **Withdrawn**

EQ-04. **Optimal Design and control of Double-Rotor Flux-Bidirectional Modulation Machine.** *Y. Wang*[1], J. Shen[2] and S. Niu[2] *1. Electrical Engineering, Zhejiang University, Hangzhou, China; 2. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

EQ-05. **Model Predictive Torque Control of Permanent Magnet Synchronous Motors for In-wheel Traction Applications.** *B. Zhu*[1], L. Chen[1], X. Sun[1] and H. Wang[1] *1. Jiangsu University, Zhenjiang, China*

EQ-06. **Experimental Evaluation of Motor Core Loss and Magnetic Flux Density with PAM Inverter under Different Excitation Angles.** *G. Nguyen*[3], K. Fujisaki[1], S. Zhong[1,4], F. Iwamoto[2], T. Kimura[2] and T. Yamada[2] *1. Toyota Technological Institute, Nagoya, Japan; 2. Electronics R&I Division, DENSO Corporation, Aichi 470-0111, Japan; 3. Research Center for Smart Vehicles, and Electromagnetic Energy System Lab, Toyota Technological Institute, Nagoya, Japan; 4. School of Mechanical Engineering, Shenyang University of Technology, Shenyang 110870, China*

EQ-07. **Investigation of Load Effect on the Magnetization Process of a Stator Consequent Pole Memory Machine.** *S. Lyu*[1], H. Yang[1], H. Lin[1], Z. Zhu[2] and Z. Pan[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

EQ-08. **Analysis of Magnetic Properties of AlNiCo and Magnetization State Estimation in Variable Flux PMSMs.** *G. Qiao*[1], M. Wang[1], F. Liu[1], Y. Liu[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

EQ-09. **Influence of Exciting Field on Electromagnetic Torque of Novel Switched Reluctance Motor.** A. Liu[1], *J. Lou*[1] and Y. Wei[1] *1. College of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

EQ-10. **Fault Tolerance Performance Analysis of Five-phase Permanent-Magnet Linear Synchronous Machine.** Q. Jiang[1] and *Q. Lu*[1] *1. Zhejiang University, Hangzhou, China*

THURSDAY MORNING 9:30 | EXHIBIT HALL A

Session ER
ACTUATION, SHIELDING AND LEVITATION (Poster Session)

Chang-Dong Yeo, Chair
Texas Tech University, , United States

ER-01. **Design Optimization and Comparative Study of Novel Linear Doubly Salient Machines With/Without Primary Slot Permanent Magnets.** Y. Shen[1] and *Q. Lu*[1] *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

ER-02. **Development of a Radial-Flux Slotted Limited-Angle Torque Motor with Non-uniform Teeth for Output Torque Improvement.** *G. Yu*[1], Y. Xu[1], J. Zou[1], L. Xiao[1], B. Zheng[1] and H. Lan[1] *1. Harbin Institute of Technology, Harbin, China*

ER-03. **Design Aspects of a Reluctance Based Magnetic Lead Screw.** M. Cirolini[1], *Á.F. Flores*[1] and Y. Wu[1] *1. Electrical Engineering, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*

ER-04. **An Improved Configuration for Cogging Torque Reduction in Transverse-flux Flux-reversal Permanent Magnet Motor.** *X. Yang*[1], B. Kou[1], Y. Zhou[1], J. Luo[1] and L. Zhang[1] *1. Harbin Institute of Technology, Harbin, China*

ER-05. **Three-Phase AC Linear Proportional Solenoid Actuator with Zero Hysteresis in Current-Thrust Force Characteristics.** *Y. Tominari*[1] and Y. Sato[1] *1. Department of Mechanical Engineering, Yokohama National University, Yokohama, Japan*

ER-06. **Comparision of Magnetic Levitation Systems Using Ring-Shaped Permanent Magnets.** *K. Kim*[1] and G. Park[1] *1. Pusan National University, Busan, The Republic of Korea*

ER-07. **Modeling and Analysis of a Magnetic Levitation Vibration Isolation System Using Magnetic Gravity Compensators.** *Y. Zhou*[1], B. Kou[1] and H. Zhang[1] *1. Harbin Institute of Technology, Harbin, China*

ER-08. **An Improved Method for Calculating the Force between Permanent Magnets Considering Inhomogeneity of Magnetization.** *Y. Zhou*[1], B. Kou[1] and H. Zhang[1] *1. Harbin Institute of Technology, Harbin, China*

THURSDAY
AFTERNOON
1:30

SALON 2

Session FA
VOLTAGE CONTROL OF NANOMAGNETISM

Jiamian Hu, Co-Chair
University of Wisconsin-Madison, Madison, WI, United States
Massimo Ghidini, Co-Chair
University of Cambridge, Cambridge, United Kingdom

1:30

FA-01. **Voltage control of the Dzyaloshinskii-Moriya interaction (DMI) and skyrmion stability.** ***(Invited)*** *A. Bernand-Mantel*[1], T. Srivastava[2], H. Bea[2], M. Schott[1], L. Ranno[1], S. Pizzini[1], S. Auffret[2] and M. Belmeguenai[3] *1. Institut Néel-CNRS, Grenoble, France; 2. SPINTEC-CEA, Grenoble, France; 3. LSPM, Université Paris 13, Villetaneuse, France*

2:06

FA-02. **Deterministic and robust room–temperature exchange coupling in monodomain multiferroic $BiFeO_3$ heterostructures.** ***(Invited)*** *C. Eom*[1] *1. Materials Science and Engineering, University of Wisconsin-Madison, Madison, WI, United States*

2:42

FA-03. **Low Voltage Control of RKKY Interaction in Synthetic Antiferromagnetic Nanostructures.** ***(Invited)*** *M. Liu*[1] *1. Electronic Materials Research Lab., School of Electrical and Information Engineering, Xian Jiaotong University, Xian, China*

3:18

FA-04. **Nanoscale magnetoelectric effects revealed by high-resolution imaging.** ***(Invited)*** *N.D. Mathur*[1] *1. Materials Science, University of Cambridge, Cambridge, United Kingdom*

3:54

FA-05. **Redox-based voltage-programmable magnetism in metal oxide/metal thin films and nanoislands.** ***(Invited)*** *K. Leistner*[1] *1. IMW, IFW Dresden, Dresden, Germany*

Session FB

SPIN-ORBIT TORQUE SWITCHING

Kyung-Jin Lee, Chair
Korea University, Seoul, The Republic of Korea

1:30

FB-01. **Spin-orbit Torque Switching of Multi-state Magnetic Structures: a Novel Route Towards Multi-level Magnetic Random Access Memory.** *S. Das*[1], L. Avraham[1], Y. Telepinsky[1], V. Mor[1], M. Schultz[1] and L. Klein[1] *1. Department of Physics, Nano-magnetism Research Center, Institute of Nanotechnology and Advanced Materials, Bar-Ilan University, Ramat-Gan 52900, Israel, Ramat Gan, Israel*

1:42

FB-02. **Spin-Orbit Torque Switching in Cr-based Heterostructure.** *T. Chuang*[1], C. Pai[2] and S. Huang[1] *1. Department of Physics, National Taiwan University, Taipei City, Taiwan; 2. Department of Materials Science and Engineering, National Taiwan University, Taipei City, Taiwan*

1:54

FB-03. **Field-free spin-orbit torque switching in a W-based magnetic heterostructure with perpendicular magnetic anisotropy.** T. Wang[1], T. Chang[2], *N. Murray*[1], T. Tsai[1], S. Lee[2] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan; 2. Institute of Physics, Academia Sinica, Taipei, Taiwan*

2:06

FB-04. **Field-free spin-orbit torque switching from geometrical domain wall pinning.** *K. Cai*[1], J. Lee[1], G. Yang[1], Y. Liu[1], R. Ramaswamy[1], P. He[1] and H. Yang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Sinpapore, Singapore*

2:18

FB-05. **The current-induced field-free switching from a weak spin-orbit interaction magnetic heterostructure.** *H. Chan*[1], T. Chen[1] and C. Pai[1] *1. Materials and Engineering, National Taiwan University, Taipei, Taiwan*

2:30

FB-06. **Sub-ns and low-power magnetization switching by combination of spin-orbit torque and spin-transfer torque.** *C. Zhang*[1,2], Y. Takeuchi[2], Y. Takahashi[2], S. Fukami[2,3] and H. Ohno[2,3] *1. FRIS, Tohoku Univ., Sendai, Japan; 2. Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku Univ., Sendai, Japan; 3. CSIS, Tohoku Univ., Sendai, Japan*

2:42

FB-07. **Field-free Magnetization Switching by Utilizing the Spin Hall Effect and Interlayer Exchange Coupling of Iridium.** *Y. Liu*[1,2], B. Zhou[1,2] and J. Zhu[3,2] *1. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Electrical & Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

2:54

FB-08. **First-principles calculation of the spin-orbit torque in a Co/Pt bilayer.** *K. Belashchenko*[1], A. Kovalev[1] and M. van Schilfgaarde[2] *1. Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States; 2. Department of Physics, King's College London, London, United Kingdom*

3:06

FB-09. **Spin-Orbit Torque Switching in Asymmetric Structures with Double Heavy Metal Layers.** *S. Razavi*[1], G. Yu[2,1], H. Wu[1], Q. Shao[1], K. Wong[1] and K. Wang[1] *1. Electrical and Computer Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China*

3:18

FB-10. **Spin-Orbit Torque Switching in a Nearly Compensated Heusler Ferrimagnet.** *J.T. Finley*[1], C. Lee[2], P. Huang[2] and L. Liu[1] *1. Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Materials Science and Engineering, University of Illinois Urbana-Champaign, Urbana, IL, United States*

3:30

FB-11. **Spin valve effect induced by spin-orbit torque switching.** *R. Zhang*[1], G. Shi[1], J. Su[2], F. Li[1], L. Liao[1], J. Cai[2], F. Pan[1] and C. Song[1] *1. Key Laboratory of Advanced Materials (MOE), School of Materials Science and Engineering, Tsinghua University, Beijing 100084, Beijing, China; 2. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, Beijing, China*

3:42

FB-12. **Relationship between spin-orbit torque switching efficiency and W resistivity in W/CoFeB/MgO.** *K. Furuya*[1], Y. Takeuchi[1], C. Zhang[2,3], B. Jinnai[3], S. Fukami[4,5] and H. Ohno[6,7] *1. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 3. Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 5. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 6. Center for Science and Innovation in Spintronics (Core Research Cluster), Tohoku University, Sendai, Japan; 7. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan*

3:54

FB-13. **Spin currents and spin-orbit torques in ferromagnetic trilayers.** S.C. Baek[1], V. Amin[2], Y. Oh[1], G. Go[3], S. Lee[3], K. Kim[1], B. Park[1], M. Stiles[2], G. Lee[1] and *K. Lee*[3] *1. KAIST, Daejeon, The Republic of Korea; 2. NIST, Gaithersburg, MD, United States; 3. Korea University, Seoul, The Republic of Korea*

4:06

FB-14. **Picosecond reorientation of in-plane magnetisation within a nano-element by spin orbit torque.** *P.S. Keatley*[1], G. Mihajlovic[2], L. Wan[2], Y. Choi[2], J.A. Katine[2] and R.J. Hicken[1] *1. Department of Physics and Astronomy, University of Exeter, Exeter, United Kingdom; 2. San Jose Research Center, HGST, a Western Digital Company, San Jose, CA, United States*

4:18

FB-15. **Micromagnetics of Spin Hall Driven Perpendicular Magnetization Switching.** *J. Zhu*[1], Y. Liu[1] and B. Zhou[1] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

THURSDAY AFTERNOON 1:30 — SALON 1

Session FC
TOPOLOGICAL SPIN TEXTURES II
Oleg Tretiakov, Chair
Tohoku University, Sendai, Japan

1:30

FC-01. **Terahertz radiation from compensated magnetic heterostructures.** *M. Chen*[1], R. Mishra[1], Y. Wu[1], K. Lee[1] and H. Yang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore*

1:42

FC-02. **Detector of terahertz-frequency signals based on an antiferromagnetic tunnel junction.** P. Artemchuk[1], O. Sulymenko[1], *O. Prokopenko*[1], V. Tyberkevych[2] and A.N. Slavin[2] *1. Faculty of Radio Physics, Electronics and Computer Systems, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; 2. Department of Physics, Oakland University, Rochester, MI, United States*

1:54

FC-03. **THz oscillations in an antiferromagnetic spin-Hall oscillator: a micromagnetic approach.** *V. Puliafito*[1], R. Khymyn[2], M. Carpentieri[3], B. Azzerboni[1], V. Tyberkevych[4], A.N. Slavin[4] and G. Finocchio[5] *1. Department of Engineering, University of Messina, Messina, Italy; 2. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 3. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy; 4. Department of Physics, Oakland University, Rochester, MI, United States; 5. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy*

2:06

FC-04. **Mutual phase locking of nonlinear THz-frequency antiferromagnetic spin-Hall oscillators.** *A. Safin*[3,2], A.N. Slavin[1], S. Nikitov[3,4] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States; 2. National Research University "MPEI", Moscow, Russian Federation; 3. Kotel'nikov Institute of Radioengineering and Electronics, Moscow, Russian Federation; 4. Moscow Institute of Physics and Technology, Dolgoprudny, Russian Federation*

2:18

FC-05. **Optical excitation of magnon spin currents and spin angular momentum transfer in antiferromagnetic insulators.** *I. Proskurin*[1,2], A. Ovchinnikov[2,3], J. Kishine[4] and R. Stamps[1] *1. Physics & Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. Institute of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, Russian Federation; 3. Institute for Metal Physics, Ekaterinburg, Russian Federation; 4. Division of Natural and Environmental Sciences, The Open University of Japan, Chiba, Japan*

2:30

FC-06. **Skyrmiogenesis: Skyrmion–antiskyrmion asymmetry from pair generation.** U. Ritzmann[1], B. Dupé[2], R.E. Camley[3] and *J. Kim*[4] *1. Department for Physics and Astronomy, Uppsala University, Uppsala, Sweden; 2. Institut für Physik, Johannes Gutenberg-Universität Mainz, Mainz, Germany; 3. Department of Physics and Energy Science, University of Colorado at Colorado Springs, Colorado Springs, CO, United States; 4. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France*

2:42

FC-07. **Domain Wall Skyrmions.** R. Cheng[2], M.P. Li[1], A. Sapkota[3], A. Rai[3], A. Pokhrel[3], T. Mewes[3], C.K. Mewes[3], M. De Graef[1], D. Xiao[2,1] and *V. Sokalski*[1] *1. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Physics & Astronomy, MINT, University of Alabama, Tuscaloose, AL, United States*

2:54

FC-08. **Vortex-antivortex Motion and Cycloidal Domains in Magnetic Trilayers Studied by Transmission X-ray Microscopy.** *C. Quiros*[1,2], A. Hierro-Rodriguez[3], A. Sorrentino[4], R. Valcarcel[4], L.M. Alvarez-Prado[1,2], J. Diaz[1,2], R. Fernandez-Gonzalez[1], J. Martin[1,2], J.M. Alameda[1,2], S. McVitie[3], E. Pereiro[4], M. Velez[1,2] and S. Ferrer[4] *1. Departamento de Física, Universidad de Oviedo, 33007 Oviedo, Spain; 2. CINN (CSIC – Universidad de Oviedo), 33940 El Entrego, Spain; 3. SUPA, University of Glasgow, School of Physics and Astronomy, G12 8QQ Glasgow, United Kingdom; 4. ALBA Synchrotron, 08290 Cerdanyola del Valles, Spain*

3:06

FC-09. **Dependence of Interfacial Dzyaloshinskii-Moriya Interaction on Layer Thicknesses in Ta/CoFeB/TaO_x Heterostructures from Brillouin Light Scattering.** *A.K. Chaurasiya*[1], S. Choudhury[1], J. Sinha[1] and A. Barman[1] *1. Condensed Matter Physics and Material Sciences, S N Bose National Centre for Basic Sciences, Kolkata, India*

3:18

FC-10. **Anisotropic Dzyaloshinskii-Moriya Interaction in a System with C_{2v} Symmetry: Epitaxial Fe/Pt(110).** B. Zimmermann[1], G. Chen[2], J.M. Shaw[3], A.K. Schmid[5], K. Liu[2,4], S. Blügel[1] and *H. Nembach*[3] *1. Peter Gruenberg Insititue, Forschungszentrum Juelich, Juelich, Germany; 2. Physics Department, University of California - Davis, Davis, CA, United States; 3. Quantum Electromagnetics Division, NIST, Boulder, CO, United States; 4. Physics Department, Georgetown University, Washington, DC, United States; 5. MSD, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

3:30

FC-11. **Sign reversal of Dzyaloshinskii-Moriya effective field with ferromagnetic layer thickness in W/(Co)FeB/MgO heterostructures.** *T. Dohi*[1], S. Duttagupta[1,2], Y. Takeuchi[1], S. Fukami[1,2] and H. Ohno[1,2] *1. RIEC, Tohoku University, Sendai, Japan; 2. CSIS, Tohoku University, Sendai, Japan*

3:42

FC-12. **Engineering the Dzyaloshinskii-Moriya interaction in B20 thin-film chiral magnets.** *E. Turgut*[1,2], H. Paik[1], K. Nguyen[1], D.A. Muller[1], D. Schlom[1] and G. Fuchs[1] *1. Cornell University, Ithaca, NY, United States; 2. Oklahoma State University, Stillwater, OK, United States*

3:54

FC-13. Formation of skyrmions in soft magnetic films without Dzyaloshinskii-Moriya interaction. D. Navas[1], R.V. Verba[2], A. Hierro-Rodriguez[1,3], S. Bunyaev[1], X. Zhou[4], A. Adeyeye[4], O. Dobrovolskiy[5,6], B. Ivanov[2,7], K. Guslienko[8,9] and *G.N. Kakazei*[1] *1. IFIMUP-IN/Department of Physics and Astronomy, University of Porto, Porto, Portugal; 2. Institute of Magnetism NAS of Ukraine, Kyiv, Ukraine; 3. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 4. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 5. Physikalisches Institut, Goethe University, Frankfurt, Germany; 6. Physics Department, V. Karazin National University, Kharkiv, Ukraine; 7. National University of Science and Technology "MISiS", Moscow, Russian Federation; 8. Departamento de Física de Materiales, Universidad del País Vasco UPV/EHU, San Sebastian, Spain; 9. IKERBASQUE, the Basque Foundation for Science, Bilbao, Spain*

4:06

FC-14. Magnetic phases of skyrmion-hosting $GaV_4S_{8-y}Se_y$ (y = 0, 2, 4, 8) probed with muon spectroscopy. *K.J. Franke*[1], B. Huddart[1], T.J. Hicken[1], F. Xiao[4,5], S.J. Blundell[3], F.L. Pratt[6], M. Crisanti[7,8], J.A. Barker[2], S.J. Clark[1], A. Štefančič[7], M. Ciomaga Hatnean[7], G. Balakrishnan[7] and T. Lancaster[1] *1. Centre for Materials Physics, Durham University, Durham, United Kingdom; 2. Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institut, Viligen, Switzerland; 3. Department of Physics, Oxford University, Oxford, United Kingdom; 4. Laboratory for Neutron Scattering, Paul Scherrer Institut, Viligen, Switzerland; 5. Department of Chemistry and Biochemistry, University of Bern, Bern, Switzerland; 6. ISIS Facility, STFC Rutherford Appleton Laboratory, Chilton, Didcot, United Kingdom; 7. Department of Physics, University of Warwick, Coventry, United Kingdom; 8. Institut Laue-Langevin, Grenoble, France*

4:18

FC-15. Influence of the multidomain structure on the nonlinear ac magnetic response in the Néel skyrmion lattice host GaV_4S_8. *E. Clements*[1], R. Das[2], G. Pokharel[3], D. Mandrus[3], M. Osofsky[4], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 3. Department of Materials Science and Engineering, University of Tennessee Knoxville, Knoxville, TN, United States; 4. Naval Research Lab, Washington, DC, United States*

Session FD
MAGNETIC FIELD SENSORS AND APPLICATIONS AT HIGH FREQUENCIES

Joseph Davies, Chair
NVE Corporation, Eden Prairie, MN, United States

1:30

FD-01. **Magneto-Impedance Response of a Double Exchange Metallic Ferromagnet: $La_{0.80}Sr_{0.20}MnO_3$.** *U. Chaudhuri*[1] and R. Mahendiran[1] *1. Physics, National University of Singapore, Singapore, Singapore*

1:42

FD-02. **Miniaturization Techniques using Magnetic Materials for Broadband Antenna Applications.** *R. Durbha*[1] and A. Mohammed[1] *1. Electrical and Computer Engineering, Tufts University, Medford, MA, United States*

1:54

FD-03. **Electrically Tunable Ferrite Band Pass Filter in X-Band with Wide Tunability.** *S. Kagita*[1], A. Basu[1] and S.K. Koul[1] *1. Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, New Delhi, India*

2:06

FD-04. **Giant Magnetostriction and Low Loss in FeGa/NiFe Laminates for Strain-Mediated Multiferroic Micro-Antenna Applications.** *K. Fitzell*[1], C.R. Rementer[1], J.D. Schneider[2], J. Hu[2], N. Virushabadoss[3], M.E. Jamer[4,5], A. Barra[2], D.B. Gopman[6], J. Borchers[5], B.J. Kirby[5], A. Sepulveda[2], R. Henderson[3], G. Carman[2] and J.P. Chang[1] *1. Chemical and Biomolecular Engineering, UCLA, Los Angeles, CA, United States; 2. Mechanical and Aerospace Engineering, UCLA, Los Angeles, CA, United States; 3. Electrical and Computer Engineering, University of Texas at Dallas, Dallas, TX, United States; 4. Physics, United States Naval Academy, Annapolis, MD, United States; 5. NCNR, NIST, Gaithersburg, MD, United States; 6. Materials Science and Engineering, NIST, Gaithersburg, MD, United States*

2:18

FD-05. **Microwave absorbing properties of mechanically jet-milled U-type hexaferrite.** S. Kumar[1], D.P. Dubey[1], *R. Chatterjee*[1] and S. Shannigrahi[2] *1. Physics, IIT Delhi, New Delhi, India; 2. A*STAR (Agency for Science, Technology and Research), Institute of Materials Research and Engineering, Singapore, Singapore*

2:30

FD-06. **High-Q on-chip C-band inductor with a nanocrystalline MnZn-ferrite film core.** R. Sai[1,2] and *M. Yamaguchi*[1] *1. Tohoku University, Sendai, Japan; 2. Indian Institute of Science, Bengaluru, India*

2:42

FD-07. **Development of Anisotropic Magnetic Nanocomposites for Miniaturized RF Device Applications.** *Y. Zhang*[1], Y. Xie[1], B. Kucukgok[1], L. Witkowski[2], Y. Cui[2], S. Yoon[3], Y. Cao[2], C. Lee[2], A. Ketterson[3] and K. Gao[1] *1. Applied Materials Division, Argonne National Laboratory, Lemont, IL, United States; 2. IDP Research, Qorvo, Richardson, TX, United States; 3. IDP, Qorvo, Newbury Park, CA, United States*

2:54

FD-08. **Electric Field Control of the Magnetic Properties in Multiferroic Heterostructures.** J. Harris[1], M.M. Saleem[1], E. Miskevich[1], S. Baco[1], J. Sharp[1], W. Yang[2], P.W. Fry[3], Z. Leong[1] and *N. Morley*[1] *1. Department of Materials Science and Engineering, University of Sheffield, Sheffield, United Kingdom; 2. Department of Engineering, University of California Santa Cruz, Santa Cruz, CA, United States; 3. Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

THURSDAY AFTERNOON 1:30 | VIRGINIA

Session FE
MAGNETO-CALORIC AND MAGNETO-OPTICAL MATERIALS

Thomas Thomson, Chair
University of Manchester, San Jose, CA, United States

1:30

FE-01. **Unusual Effects of Sc Substitution and Processing on Magnetism of $(Gd_{1-x}Sc_x)_5Ge_4$.** J. Liu[1,2], *Y. Mudryk*[1], D. Paudyal[1] and V.K. Pecharsky[1,2] *1. Ames Laboratory, Iowa State University, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

1:42

FE-02. **Critical behavior and magnetocaloric effect in GdSc(Si,Ge) intermetallics.** A. Herrero[1], *A. Oleaga*[1], P. Manfrinetti[2,3], A. Provino[2,3] and A. Salazar[1] *1. Faculty of Engineering/Applied Physics I, University of the Basque Country, Bilbao, Spain; 2. Department of Chemistry, University of Genova, Genova, Italy; 3. Institute SPIN-CNR, Genova, Italy*

1:54

FE-03. **Withdrawn**

2:06

FE-04. **Magnetocaloric effect in 2D ferromagnetic semiconductor $Cr_2Ge_2Te_6$.** *N. R*[1], A. V[1], A.V. Morozkin[2] and A.K. Nigam[3] *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. Chemistry, Moscow State University, Moscow, Russian Federation; 3. DCMPMS, Tata Institute of Fundamental Research, Mumbai, India*

2:18

FE-05. **Quantifying Individual Contributions of Magnetic Interactions in Magnetocaloric FeCoNiCuMn High Entropy Alloys using Mossbauer Spectroscopy.** *A.E. Perrin*[1], M. Sorescu[2], V. Ravi[3], M.E. McHenry[1] and D. Laughlin[1] *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physics, Duquesne University, Pittsburgh, PA, United States; 3. Materials Science and Engineering, Berkeley, Berkeley, CA, United States*

2:30

FE-06. **Strong Coupling between Cavity Photons and Nano-Ferromagnet Magnons.** *J.T. Hou*[1] and L. Liu[1] *1. Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States*

2:42

FE-07. **Magnetic and Optical Studies of 2D Antiferromagnetic $MnPS_3$.** *C. Zhao*[1], P. Zhang[1], Y. Cheng[2], A. Petrou[1] and H. Zeng[1] *1. Physics, State Univ of NY - Buffalo, Buffalo, NY, United States; 2. Advanced Material, Nanjing Tech University, Nanjing, China*

2:54

FE-08. **Magnetic-field patterning of a spintronic source for arbitrary THz polarization control.** M. Hibberd[1,3], D. Lake[1,3], N. Johansson[2], S. Jamison[3,4], *T. Thomson*[2] and D. Graham[1,3] *1. School of Physics and Astronomy & Photon Science Institute, University of Manchester, Manchester, United Kingdom; 2. School of Computer Science, University of Manchester, Manchester, United Kingdom; 3. The Cockcroft Institute, Warrington, United Kingdom; 4. Accelerator Science and Technology Centre, Science and Technology Facilities Council, Warrington, United Kingdom*

3:06

FE-09. **Enhanced Magneto-optical Kerr Rotation in Yttrium Iron Garnet-Bismuth Quantum Dots Hybrid System by Spin-Orbit Coupling.** *L. Jin*[1], P. Gao[2], H. Zhang[1], Z. Zhong[1], M. Liu[2] and D. Zhang[3] *1. State Key Laboratory of Electronic Thin Films and Integrated Devices, University of Electronic Science and Technology of China, Chengdu, China; 2. School of Physics, Peking University, Beijing, China; 3. University of Delaware, Department of Physics and Astronomy, Newark, DE, United States*

3:18

FE-10. **Time-resolved quadratic magneto-optical Kerr effect for studies of magnetic dynamics of antiferromagnetic materials.** *K. Yang*[1], K. Kang[1], A. Ramanathan[1], D. Shoemaker[1], A. Schleife[1] and D.G. Cahill[1] *1. University of Illinois at Urbana Champaign, Urbana, IL, United States*

3:30

FE-11. **Directly coated Bragg mirror on magnetic garnet film for small magnetooptical Q-switch.** *R. Morimoto*[1], T. Goto[1,2], J.W. Pritchard[3], Y. Nakamura[1], P. Lim[1], M. Mina[3], T. Taira[4], H. Uchida[1] and M. Inoue[1] *1. Toyohashi University of Technology, Toyohashi, Japan; 2. JST PRESTO, Kawaguchi, Japan; 3. Iowa State University, Ames, IA, United States; 4. Institute for Molecular Science, Okazaki, Japan*

3:42

FE-12. **High-contrast Magnetooptical Spatial Light Modulators Based on RGB Magnetophotonic Crystals.** S. Kharratian[2], H. Urey[1,2] and *M.C. Onbasli*[1,2] *1. Electrical and Electronics Engineering, Koç University, Istanbul, Turkey; 2. Materials Science and Engineering, Koc University, Istanbul, Turkey*

3:54

FE-13. **Magneto-optical Terbium Iron Garnet and Bi and Ce-substituted Terbium Iron Garnet thin films for nonreciprocal photonics.** *T. Fakhrul*[1], E. Tsotsos[1], L. Beran[2], B. Song[1], Y. Zhang[1], E.R. Rosenberg[1], M. Veis[2] and C. Ross[1] *1. Materials Science and Engineering, MIT, Cambridge, MA, United States; 2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia*

4:06

FE-14. **Manipulation of the magneto-optical efficiencies by a hybridization of nanomagnets and plasmons.** *Y. Yasukawa*[1], R. Hara[1,2], H. Yamane[3] and M. Kobayashi[1] *1. Chiba Institute of Technology, Narashino, Japan; 2. Nihon Dempa Kogyo Co., Ltd., Sayama, Japan; 3. Akita Industrial Technology Center, Akita, Japan*

4:18

FE-15. **Magnetic and Magneto-Optical Properties of Seedlayer-Free Cerium-Doped Terbium Iron Garnets.** *K. Srinivasan*[1], R. Peng[1], T. Gage[2], P. Dulal[2], C. Radu[3], L. Mo[1] and B. Stadler[1,2] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 3. Lake Shore Cryotronics, Inc., Westerville, OH, United States*

Session FF

SPIN TRANSFER TORQUE MRAM II

Minh-Hai Nguyen, Chair
Raytheon BBN Technologies, Cambridge, MA, United States

1:30

FF-01. **Perpendicular magnetized magnetic random access memory (MRAM) cells utilizing the precessional spin current (PSC) structure, benefits for modern memory applications.** *M. Pinarbasi*[1], B. Kardasz[1], G. Wolf[1], J. Vasquez[1], S. Watts[1], T. Boone[1], J. Hernandez[1], K.D. Bozdag[1], M. Schabes[1], P. Manandhar[1], E. Dobisz[1], P. Shrivastava[1], Y. Chin[1], E. Ryan[1] and G. Jagtiani[1] *1. Spin Transfer Technologies Inc., Fremont, CA, United States*

1:42

FF-02. **Thermal stability determination by current-driven switching: limitations of macrospin model and relation to size-dependence paradox.** *D. Apalkov*[1], S. Wang[1] and V. Nikitin[1] *1. New Memory Technology, Samsung Semiconductor Inc, San Jose, CA, United States*

1:54

FF-03. **From conventional STT-MRAM to Perpendicular Shape Anisotropy STT-MRAM (PSA-STT-MRAM): Dramatic reduction in thermal variation of anisotropy.** N. Perrissin[1], G. Grégoire[1], S. Lequeux[1], L. Tille[1], N. Strelkov[1], A. Chavent[1], S. Auffret[1], L.D. Buda-Prejbeanu[1], R.C. Sousa[1], L. Vila[1], I.L. Prejbeanu[1] and *B. Dieny*[1] *1. INAC-SPINTEC, Univ.Grenoble Alpes, CEA, CNRS, Grenoble-INP*, Grenoble, France*

2:06

FF-04. **Perpendicular Shape Anisotropy STT-MRAM (PSA-STT-MRAM): Determination of pillar tilt from 3D Stoner Wohlfarth astroïd analysis.** N. Perrissin[1], G. Grégoire[1], S. Lequeux[1], L. Tille[1], N. Strelkov[1], A. Chavent[1], S. Auffret[1], L.D. Buda-Prejbeanu[1], R.C. Sousa[1], L. Vila[1], *I.L. Prejbeanu*[1] and B. Dieny[1] *1. INAC-SPINTEC, Univ.Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France*

2:18

FF-05. **STT efficiency modulation in double barrier pSTT-MRAM cell with read/write mode control layer.** P. Coelho[1], J. Chatterjee[1], N. Lamard[1], Y. Bel[1], *A. Chavent*[1], C. Baraduc[1], N. Strelkov[1], S. Auffret[1], L.D. Buda-Prejbeanu[1], R.C. Sousa[1], L. Vila[1], I.L. Prejbeanu[1] and B. Dieny[1] *1. SPINTEC, Grenoble, France*

2:30

FF-06. **Insertion Layer Thickness Dependence of Magnetic and Electrical Properties for Double CoFeB/MgO Interface Magnetic Tunnel Junctions.** *S. Miura*[1], H. Sato[1,2], S. Ikeda[1,2], K. Nishioka[1], H. Honjo[1] and T. Endoh[1,3] *1. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Graduate School of Engineering, Tohoku University, Sendai, Japan*

2:42

FF-07. **Low RA Perpendicular MTJs with High Thermal Tolerance for STT-MRAM.** *R. Whig*[1], C. Ching[1], X. Wang[1], P. Agrawal[1], D. Kim[1], L. Xue[1], J. Ahn[1], H. Tseng[1], M. Pakala[1], R. Wang[1] and X. Tang[1] *1. Applied Materials, Sunnyvale, CA, United States*

2:54

FF-08. **Pulsed Spin Torque Switching of Spin-Valve Devices with Diluted and Undiluted Permalloy Free Layers.** *L. Rehm*[2], V. Sluka[2], J. Beik Mohammadi[2], M. Nguyen[1], G. Rowlands[1], T.A. Ohki[1] and A.D. Kent[2] *1. Raytheon BBN Technologies, Cambridge, MA, United States; 2. Center for Quantum Phenomena, Department of Physics, New York University, Nw York, NY, United States*

3:06

FF-09. **Perpendicular Magnetized Magnetic Tunnel Junctions with SAF Structure Comprising Co/Pt and Co/Ir Multilayers.** *K. Nakamura*[1], H. Maehara[2,3], H. Tomita[1,3], K. Nagasaka[1,3], Y. Tanaka[1,3], A. Gomi[1] and N. Watanabe[1] *1. Tokyo Electron Technology Solutions Limited, Nirasaki, Japan; 2. Tokyo Electron Limited, Nirasaki, Japan; 3. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

3:18

FF-10. **Diffusion Control in Top-Pinned STT-MRAM Magnetic Tunnel Junctions.** *R. Carpenter*[1], J. Swerts[1], S. Couet[1], S. Mertens[1], E. Liu[1], W. Kim[1], S. Rao[1], S. Kundu[1] and G.S. Kar[1] *1. Imec, Leuven, Belgium*

3:30

FF-11. **Determination of the Exchange Energy of Composite Perpendicular Magnetic Tunnel Junction Free Layers.** *J. Beik Mohammadi*[1], B. Kardasz[2], G. Wolf[2], M. Pinarbasi[2] and A.D. Kent[1] *1. Center for Quantum Phenomena, Physics, New York University, New York, NY, United States; 2. Spin Transfer Technologies Inc, Freemont, CA, United States*

3:42

FF-12. **Magnetic and free-layer properties of MgO/(Co)FeB/MgO structure: Dependence on CoFeB composition.** *M. Bersweiler*[1], H. Sato[1] and H. Ohno[1] *1. Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan*

3:54

FF-13. **Effect of tunnel-electron spin-flip scattering on the shape of IV curves in CoFeB-MgO-CoFeB type of magnetic tunnel junctions.** *J. Sun*[1], J.J. Nowak[1], G. Hu[1], M.G. Gottwald[1], R.R. Robertazzi[1], P.L. Trouilloud[1], G. Lauer[1], P. Hashemi[1], E. O'Sullivan[1], R. Kothandaraman[1], B. Doris[1] and D. Worledge[1] *1. IBM Research, Yorktown Heights, NY, United States*

4:06

FF-14. **Novel Low Damage MTJ Etch Chemistry for High Performance STT-MRAM.** *S. Kang*[1], T. Kubo[1], Y. Yagi[1] and T. Endoh[2] *1. Tokyo Electron Ltd., Sendai, Miyagi, Japan; 2. Center for Innovative Integrated Electronic Systems (CIES), Tohoku University, Sendai, Miyagi, Japan*

4:18

FF-15. **Spin transfer torque random access memories based on band-pass Fabry-Pèrot physics.** *A. Sharma*[1], A. Tulapurkar[1] and B. Muralidharan[1] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

THURSDAY AFTERNOON 1:30 WASHINGTON 1

Session FG
MICROMAGNETIC AND HYSTERESIS MODELING I
Vitaliy Lomakin, Chair
University of California - San Diego, La Jolla, CA, United States

1:30

FG-01. **Novel micromagnetic approach for self-consistent modeling of magneto-thermodynamics.** ***(Invited)*** *O. Chubykalo-Fesenko*[1], P. Nieves[2], D. Serantes[3], R. Otxoa[5,4] and R.W. Chantrell[6] *1. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain; 2. University of Burgos, Burgos, Spain; 3. University of Santiago de Compostela, Santiago de Compostela, Spain; 4. DIPC, San Sebastian, Spain; 5. Hitachi, Cambridge, United Kingdom; 6. The University of York, York, United Kingdom*

2:06

FG-02. **Analytical treatment of broadband nonlinear ferromagnetic resonance in uniaxial nanomagnets.** *C. Serpico*[1], M. d'Aquino[2], V. Scalera[1], A. Quercia[1], S. Perna[1] and I. Mayergoyz[3] *1. DIETI, University of Napoli Federico II, Napoli, Italy; 2. DING, University of Napoli "Parthenope", Napoli, Italy; 3. ECE Department, University of Maryland, College Park, MD, United States*

2:18

FG-03. **Large Scale Finite-Element Simulation of Micromagnetic Thermal Noise.** *F. Bruckner*[1], M. d'Aquino[2], C. Serpico[3], C. Abert[1], C. Vogler[1] and D. Suess[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. Department of Technology, University of Napoli "Parthenope", Napoli, Italy; 3. Department of Electrical Engineering, University of Napoli "Federico II", Napoli, Italy*

2:30

FG-04. **Using a Micromagnetic Eigenmode Solver and the Vector Hamiltonian Formalism to Accelerate Simulations.** *G. Rowlands*[1], L.M. Ranzani[1], A.N. Slavin[2] and V. Tyberkevych[2] *1. Physical Sciences and Systems, Raytheon BBN Technologies, Cambridge, MA, United States; 2. Physics, Oakland University, Rochester, MI, United States*

2:42

FG-05. **Magnetic Microstructure Machine Learning Analysis.** *L. Exl*[1,2], J. Fischbacher[4], A. Kovacs[4], M. Gusenbauer[4], G. Hrkac[3] and T. Schrefl[4] *1. Wolfgang Pauli Institute, University of Vienna, Vienna, Austria; 2. Institute of Mathematics, University of Vienna, Vienna, Austria; 3. College of Engineering, The University of Exeter, Exeter, United Kingdom; 4. Center for Integrated Sensor Systems, Danube University Krems, Wr. Neustadt, Austria*

2:54

FG-06. **Limitations of the Macrospin Approximation of Materials with Inhomogeneous Perpendicular Anisotropy.** *A. Sapkota*[1], J. Beik Mohammadi[2], A. Rai[1], A. Pokhrel[1], M.P. Li[3], D.K. Lau[3], M. De Graef[3], V. Sokalski[3], T. Mewes[1] and C.K. Mewes[1] *1. Department of Physics and Astronomy, MINT Center, The University of Alabama, Tuscaloosa, AL, United States; 2. Center for Quantum Phenomena, Department of Physics, New York University, New York, NY, United States; 3. Department of Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

3:06

FG-07. **Characterization of cw laser-induced thermal gradients in magnetic tunnel junctions integrated into microresonators via COMSOL simulations.** *H. Cansever*[1,2], J. Lindner[1], T. Huebner[3], A. Niesen[3], G. Reiss[3], J. Fassbender[1,2] and A. Deac[1] *1. Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Institute of Solid State Physics, TU Dresden, Dresden, Germany; 3. Physics Department, University of Bielefeld, Bielefeld, Germany*

3:18

FG-08. **Experimentally-Derived Parameters for Local Magnetic Anisotropy Term in Spin-Lattice Dynamics Simulations.** *J.R. Cooke*[1] and J.R. Lukes[1] *1. Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, PA, United States*

3:30

FG-09. Analysis of switching times statistical distributions for magnetic nanoparticles. *M. d'Aquino*[1], V. Scalera[2] and C. Serpico[2] *1. DING, University of Napoli "Parthenope", Napoli, Italy; 2. DIETI, University of Napoli Federico II, Napoli, Italy*

3:42

FG-10. Mapping Magnetisation in Compensating Synthetic Ferrimagnets with Negative Remanence. *J.N. Scott*[1], W.R. Hendren[1], R.W. Chantrell[2], R.F. Evans[2], R.J. Hicken[3], M. Dabrowski[3] and R. Bowman[1] *1. Queen's University Belfast, Belfast, United Kingdom; 2. University of York, York, United Kingdom; 3. University of Exeter, Exeter, United Kingdom*

3:54

FG-11. Micromagnetic modeling of non-uniformities in magnetic tunnel junctions for MRAM devices. *I. Volvach*[1], M.V. Lubarda[2] and V. Lomakin[3] *1. Material Science and Engineering, University of California San Diego, San Diego, CA, United States; 2. Faculty of Polytechnics, University of Donja Gorica, Donja Gorica, Montenegro; 3. Department of Electrical and Computer Engineering, University of California San Diego, San Diego, CA, United States*

4:06

FG-12. Fast parallel techniques for the calculation of the dipole-dipole interaction. *R.A. Pepper*[1], M. Beg[2], D.I. Cortés-Ortuño[1], O. Hovorka[1] and H. Fangohr[2,1] *1. Faculty of Physical Sciences and Engineering, University of Southampton, Southampton, United Kingdom; 2. European XFEL GmbH, Schenefeld, Germany*

4:18

FG-13. Extended Micromagnetic Modeling for All Optical Switching. *V. Raposo*[1], E. Martinez[1], M. Zazo[1] and A. Hernandez[1] *1. Fisica Aplicada, University of Salamanca, Salamanca, Spain*

THURSDAY AFTERNOON 1:30 — WASHINGTON 2

Session FH

SOFT MAGNETIC COMPONENTS: PERFORMANCE, MODELING AND OPTIMIZATION

Faxiang Qin, Chair
Zhejiang University, Hangzhou, China

1:30

FH-01. Podded marine propulsion till Formula-E cars: Requirements and limits of magnetic materials. ***(Invited)*** *G. Shrestha*[1] *1. ABB INC Corporate Research, Raleigh, NC, United States*

2:06

FH-02. Iron loss properties of magnetic materials under PWM inverter excitation at high temperatures. *A. Yao*[1] and T. Hatakeyama[1] *1. Department of Electrical and Computer Engineering, Toyama Prefectural University, Imizu, Japan*

2:18

FH-03. Reluctance Network Model of Three-Phase-Laminated-Core Variable Inductor Considering Magnetic Hysteresis Behavior. *Y. Hane*[1], K. Nakamura[1], T. Ohinata[2] and K. Arimatsu[2] *1. Graduate school of Engineering, Tohoku University, Sendai, Japan; 2. Tohoku Electric Power Co., Inc., Sendai, Japan*

2:30

FH-04. Finite Element Analysis (FEA) Modeling of High Frequency Single Phase Solid State Transformers Enabled by Metal Amorphous Nanocomposites (MANC) and Calculation of Leakage Inductance for Different Winding Topologies. *M. Nazmunnahar*[1], S. Simizu[1], P. Ohodnicki[1], S. Bhattacharya[2] and M.E. McHenry[1] *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Electrical Engineering Department, North Carolina State University, Raleigh, NC, United States*

2:42

FH-05. Leakage Flux Mitigation of Laminated Ribbon Core based Transformer for a Triple Active Bridge DC-DC Converter. *M.A. Juds*[1], Z. Xu[1], M. Rashidi[1] and R. Gao[1] *1. Corporate Research and Technology, Eaton Corporation, Menomonee Falls, WI, United States*

2:54

FH-06. Comparison of DC Current and Bias Field Tuning of High Frequency Inductors with Magnetic Core. H. Wu[1], M. Khdour[1], *Y. Wu*[1] and H. Yu[1] *1. Arizona State University, Tempe, AZ, United States*

3:06

FH-07. Influence of Electric and Magnetic Biases on Tunable Magnetoelectric Inductor. *J. Zhang*[1], D. Chen[1], Q. Zhang[1], L. Jiang[1], X. Hang[1], K. Li[1], W. Zhu[1] and L. Cao[1] *1. Zhengzhou University of Light Industry, Zhengzhou, China*

3:18

FH-08. Broadband circuit models of Ferrite cores including dimensional resonance, saturation, and hysteresis. B. Wunsch[1], *T. Christen*[1], S. Skibin[1] and V. Forsstrom[2] *1. ABB Corporate Research, Baden-Dättwil, Switzerland; 2. ABB Oy Drives, Helsinki, Finland*

3:30

FH-09. **Ultra-low Profile Integrated Magnetic Inductors and Transformers for HF Applications.** *J. Michel*[1], H. Sibuet[1], N. Buffet[1], J. Bastien[1], R. Hida[1], B. Viala[1], P. Poveda[2], A. Berneux-Dugast[2], E. Bruno[2] and C. Falub[3] *1. Univ. Grenoble Alpes, CEA, LETI, F-38000 Grenoble, France; 2. ST Microelectronics, F-37100 Tours, France; 3. Evatec AG, CH-9477 Trübbach, Switzerland*

3:42

FH-10. **Design, Fabrication and Characterization of Package Embedded Solenoidal Magnetic Core Inductors for High Efficiency System In Package Integrated Voltage Regulators.** *M.L. Bellaredj*[1,2], A.K. Davis[1,2], P. Kohl[3,2], M. Swaminathan[1,2] and S. Sandler[4] *1. School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, United States; 2. Center for Co-Design of Chip, Package, System (C3PS), Georgia Institute of Technology, Atlanta, GA, United States; 3. School of Chemical and Bio-molecular Engineering, Georgia Institute of Technology, Atlanta, GA, United States; 4. Picotest, Phoenix, AZ, United States*

3:54

FH-11. **3D coupled magnetic-fluid-thermal analysis and validation of 10kV oil-immersed triangular wound core transformer.** *R. Gong*[1,2], Z. Tang[1], S. Wang[3], T. Henneron[1] and J. Ruan[2] *1. L2EP-Laboratoire d'Electrotechnique et d'Electronique de Puissance, Lille University, Arts et Metiers Paris Tech, Centrale Lille, HEI, EA 2697, Lille, F-59000, France; 2. School of Electrical Engineering, Wuhan University, Wuhan, China; 3. State Key Laboratory of Electrical Insulation and Power Equipment, School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China*

4:06

FH-12. **Efficiency Comparison between a Permanent Magnet Generator and a Pseudo Direct Drive.** C.D. Neves[2] and *Á.F. Flores*[1] *1. DELET, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; 2. Centro de Engenharias, Universidade Federal de Pelotas, Pelotas, Brazil*

4:18

FH-13. **Multi-Frequency Multi-Power One-to-Many Wireless Power Transfer System.** *W. Liu*[1], K. Chau[1], C. Lee[1,2], C. Jiang[1] and W. Han[1] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong, China; 2. Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA, United States*

Session FI

MAGNETIC NANOPARTICLES FOR BIOMEDICAL APPLICATIONS AND IMAGING

Bethanie Stadler, Chair

University of Minnesota, Minneapolis, MN, United States

1:30

FI-01. **Element-Selective Measurement of Magnetic Properties in Bimagnetic Nanoparticles and Binary Ferrofluids by X-ray Magnetic Spectroscopies.** ***(Invited)*** *A. Juhin*[1], N. Daffé[2], M. Sikora[3], J. Zecevic[4], K. Trohidou[5], J. Nogues[6], N. Bouldi[7], V. Gavrilov[8], S. Neveu[9], F. Choueikani[10], V. Dupuis[8], P. Ohresser[10], M. Arrio[1], M. Rovezzi[11] and P. Sainctavit[1] *1. CNRS, Paris, France; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. AGH University, Krakow, Poland; 4. Debye Institute, Utrecht, Netherlands; 5. NCSR "Demokritos", Athens, Greece; 6. Catalan Institute of Nanoscience and Nanotechnology (ICN2), Barcelona, Spain; 7. Heidelberg University, Heidelberg, Germany; 8. Sorbonne Université, Paris, France; 9. Sorbonne Université, Paris, France; 10. Synchrotron SOLEIL, Saint-Aubin, France; 11. ESRF, Grenoble, France*

2:06

FI-02. **Magnetic characterization of bi-directional aligned collagen fibrils using nickel nanowires for bio-medical applications.** *M. Zamani Kouhpanji*[1], Y. Zhang[1], S. Roughani[2], J. Um[1], R. Franklin[1] and B. Stadler[1,2] *1. Electrical and Computer Engineering, University of Minnesota Twin Cities, Minneapolis, MN, United States; 2. Chemical Engineering and Material Science, University of Minnesota Twin Cities, Minneapolis, MN, United States*

2:18

FI-03. **Novel Production of Magnetite Particles via Thermochemical Processing of Digestate from Manure and Food Waste.** D. Rodriguez Alberto[1], *K. Repa*[2], S. Hegde[1], C. Miller[2] and T.A. Trabold[1] *1. Golisano Instutute for Sustainability, Rochester Institute of Technology, Rochester, NY, United States; 2. School of Chemistry and Materials Science, Rochester Institute of Technology, Rochester, NY, United States*

2:30

FI-04. **Magnetic Characterization of Ferrite Particles Employed as a Contrast Agent for Magnetic Resonance Imaging Thermometry.** N.A. Alghamdi[1], J. Stroud[1], T. Read[1], J.H. Hankiewicz[1], R.E. Camley[1] and *Z. Celinski*[1] *1. UCCS BioFrontiers Center, University of Colorado, Colorado Springs, CO, United States*

2:42

FI-05. **Exploring Relaxation Dynamics and Temperature Sensitivity of Magnetic Nanoparticles using Magnetic Particle Spectroscopy.** *H. Khurshid*[1,2], Y. Shi[4], Z. Nemati[3], M. Phan[3], H. Srikanth[3] and J. Weaver[1,4] *1. Radiology, Dartmouth Hitchcock Medical Center, Lebanon, NH, United States; 2. Applied Physics and Astronomy, University of Sharjah, Sharjah, United Arab Emirates; 3. Applied Physics, University of South Florida, Tampa, FL, United States; 4. Physics, Dartmouth College, Hanover, NH, United States*

2:54

FI-06. **Shape anisotropy effects on magnetic and hyperthermia properties of iron oxide nanoparticles.** *J. Mohapatra*[1], J. Beatty[1], M. Xing[1], J. Elkins[1] and P. Liu[1] *1. Department of Physics, University of Texas at Arlington, Arlington, TX, United States*

3:06

FI-07. **Intra-nasal transport of particles into rodent brain by magnetic drilling.** *S. Jafari*[1], L. Mair[1], I. Weinberg[1], J. Baker-McKee[1], O. Hale[1], J. Watson-Daniels[1], B. English[1], P. Stepanov[1], C. Ropp[1], O. Atoyebi[1] and D. Sun[1] *1. Weinberg Medical Physics, Inc, North Bethesda, MD, United States*

3:18

FI-08. **Development of magnetic probe for laparoscopic identification of sentinel lymph nodes.** *R. Tanaka*[1], A. Kuwahata[1], S. Chiaki[1], S. Matsuda[2], E. Amada[2], M. Kusakabe[1,3] and M. Sekino[1] *1. The University of Tokyo, Bunkyo, Japan; 2. Keio University, Shinjuku, Japan; 3. Matrix Cell Research Institute Inc., Ushiku, Japan*

3:30

FI-09. **Uric acid crystals control firefly bioluminescence under magnetic fields.** *M. Iwasaka*[1] and Y. Takeuchi[2] *1. Hiroshima University, Higashihiroshima, Japan; 2. Muroran Institute of Technology, Muroran, Japan*

3:42

FI-10. **Size effect: Effective T_2 (T_2*) of gadolinium silicide (Gd_5Si_4) ferromagnetic nanoparticles (NPs) for high magnetic field (21.1 T) MRI.** *S. Hunagund*[1], J. Rosenberg[3], S.M. Harstad[1], S. Gupta[2], V.K. Pecharsky[2,4], A.A. El-Gendy[5] and R.L. Hadimani[1] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Ames Laboratory, Iowa State University, Ames, IA, United States; 3. The National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, United States; 4. Material Science and Engineering, Iowa State University, Ames, IA, United States; 5. Physics, University of Texas at El Paso, El Paso, TX, United States*

3:54

FI-11. **Enhanced T_1 contrast with superparamagnetic nanoparticles in ultra-low field magnetic resonance imaging.** *X. Yin*[1,2] *1. Western Digital, Fremont, CA, United States; 2. National Institute of Standards and Technology, Boulder, CO, United States*

4:06

FI-12. **Dynamically Interleaved Magnetic Resonance Imaging Using AlNiCo Electropermanent Magnet Arrays.** *C. Ropp*[1], C. Chen[2], J. Glickstein[2], L. Mair[1], O. Hale[1], J. Baker-McKee[1], M. Greer[2], D. Ariando[2], J. Watson-Daniels[1], S. Jafari[1], S. Mandal[2] and I. Weinberg[1] *1. Weinberg Medical Physics, Rockville, MD, United States; 2. Department of Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, OH, United States*

4:18

FI-13. **Recovery of reflective properties in deep-sea fish photophores by applying magnetic fields.** *J. Paitio*[1], Y. Oba[1], E. Muneyama[2], H. Asada[2] and M. Iwasaka[3] *1. Chubu University, Kasugai, Japan; 2. Yamaguchi University, Ube, Japan; 3. Hiroshima University, Higashi Hiroshima, Japan*

THURSDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session FJ
NEW AND NANOSTRUCTURED PERMANENT MAGNETS II (Poster Session)

Durga Paudyal, Co-Chair
Ames Laboratory, US DOE, Iowa State University, Ames, IA, United States
Parashu Kharel, Co-Chair
South Dakota State University, Brookings, SD, United States
Bishnu Dahal, Co-Chair
South Dakota State University, Brookings, SD, United States

FJ-01. **Effect of Milling Time on the Morphology and Magnetic Properties of Nanocrystalline $Sm_{0.6}Pr_{0.4}Co_5$ Powders Prepared by High-energy Ball Milling.** *J. Liang*[1], Y. Li[1], M. Yue[1], D. Zhang[1], W. Liu[1], H. Zhang[1], Q. Wu[1] and Z. Shang[1] *1. Beijing University of Technology, Beijing, China*

FJ-02. **Anisotropy and Magnetic Properties of Hot Deformed $Sm(CoCuFeZr)_7$ magnet Doped by PrCu Alloy.** W. Jiang[1], D. Zhang[1], Z. Shang[1], X. Xu[1], H. Zhang[1], Q. Wu[1], W. Liu[1] and *M. Yue*[1] *1. College of Materials Science and Engineering, Beijing University of Technology, Beijing, China*

FJ-03. **Directional dependence of grain boundary phases in a permanent magnet.** *H. Tsukahara*[1], K. Iwano[1], C. Mitsumata[2], T. Ishikawa[1] and K. Ono[1] *1. High Energy Accelerator Research Organization, Tsukuba, Japan; 2. National Institute for Materials Science, Tsukuba, Japan*

FJ-04. **Effect of Bismuth on Chemically Synthesized Fe-Pt-Ni Alloy.** *V. Deepchand*[1], F.M. Abel[1], V. Tzitzios[2] and G. Hadjipanayis[1] *1. Physics and Astronomy, University of Delaware, Newark, DE, United States; 2. Department of Chemical Engineering, Khalifa University of Science and Technology, Petroleum Institute, Abu Dhabi, United Arab Emirates*

FJ-05. Thermal stability of $L1_0$-FeNi synthesized by the NITE method. *E. Watanabe*[1], S. Goto[1], H. Kura[1], H. Yanagihara[3], M. Mizuguchi[2], K. Takanashi[2] and E. Kita[3,4] *1. Advanced Research and Innovation Center, DENSO Corporation, Aichi, Japan; 2. Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Institute of Applied Physics, University of Tsukuba, Ibaraki, Japan; 4. National Institute of Technology, Ibaraki College, Ibaraki, Japan*

FJ-06. Micromagnetic Simulations to Understand Angular Dependence of Coercivity in $L1_0$ FeNi based alloys. *P. Sharma*[1] and A. Makino[1] *1. New Industry Creation Hatchery Center (NICHe), Tohoku University, Sendai, Japan*

FJ-07. Magnetocrystalline Anisotropy of Co_3Si (001) Films from First Principles. *R. Pathak*[1], B. Balasubramanian[2,3], D.J. Sellmyer[2,3], R. Skomski[2,3] and A. Kashyap[1] *1. School of Basic Sciences, Indian Institute of Technology, Mandi, India; 2. Nebraska Center for Materials and Nanoscience, University of Nebraska Lincoln, Lincoln, NE, United States; 3. Department of Physics and Astronomy, University of Nebraska Lincoln, Lincoln, NE, United States*

FJ-08. High pressure synthesis of bulk MnBi magnets from surface modified powders. P. Si[1,2], Y. Yang[1], X. Wang[1,2], H. Ge[2], J. Park[1], J. Lim[1] and *C. Choi*[1] *1. Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. China Jiliang University, Hangzhou, China*

FJ-09. Effect of Fe composition on the structure and magnetic properties for Mn-Ga-N thin films. K. Ohwada[1], M. Doi[1] and *T. Shima*[1] *1. Faculty of Engineering, Tohoku Gakuin University, Tagajo, Japan*

FJ-10. Iron nanoparticles with tunable tetragonal structure and magnetic properties. *J. Liu*[1], K. Schliep[2], S. He[1], B. Ma[1], Y. Jing[1], D.J. Flannigan[2] and J. Wang[1,2] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

FJ-11. Effects of packing density on the magnetic properties of cobalt nanowire assemblies. *M. Xing*[1], J. Mohapatra[1], J. Elkins[1] and P. Liu[1] *1. Physics, University of Texas at Arlington, Arlington, TX, United States*

FJ-12. Local magnetic interactions in Cadmium-doped Cobalt allotropic phases by first principles calculation. *L.F. Pereira*[1] and A.W. Carbonari[1] *1. IPEN, Sao Paulo, Brazil*

FJ-13. Magnetic properties and microstructure of nanocomposite $(La,Pr)_3Fe_{14}B$ ribbons by doping La element. *Y. Li*[1], S. Peng[1], M. Zhang[2], S. Wang[3], S. Zhu[1], J. Zhang[4] and F. Shen[4] *1. The State Key Laboratory of Refractories and Metallurgy, Hubei Province Key Laboratory of Systems Science in Metallurgical Process, International Research Institute for Steel Technology, Wuhan University of Science and Technology, Wuhan, China; 2. Faculty of Science, Inner Mongolia University Of Science and Technology, Inner Mongolia, China; 3. Faculty of Science, Northwestern Polytechnical University, Xian, China; 4. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

Session FK

THIN FILMS AND SURFACE EFFECTS II (Poster Session)

Alexey Kovalev, Co-Chair
University of Nebraska-Lincoln, Lincoln, NE, United States
Alexander Samardak, Co-Chair
Far Eastern Federal University, Vladivostok, Russian Federation

FK-01. **The electronic transport properties of ferromagnetic cobaltate $La_{0.8}Sr_{0.2}CoO_3$ film heterojunctions.** *Y. Li*[1], S. Peng[1], D. Wang[1], K. Wu[1], S. Zhu[1], S. Wang[2] and F. Shen[3] *1. The State Key Laboratory of Refractories and Metallurgy, Hubei Province Key Laboratory of Systems Science in Metallurgical Process, International Research Institute for Steel Technology, Wuhan University of Science and Technology, Wuhan, China; 2. Faculty of Science, Northwestern Polytechnical University, Xian, China; 3. The Institute of Physics, Chinese Academy of Sciences, Beijing, China*

FK-02. **Electric and magnetic properties of $Ni_{78}Fe_{22}/Alq_3/Ni_{78}Fe_{22}$ nanoscale junction devices utilizing magnetic thin-film edges.** *Y. Sasaki*[1], R. Msiska[1], T. Misawa[1], S. Mori[1], T. Komine[2], N. Hoshino[3], T. Akutagawa[3], M. Fujioka[1], J. Nishii[1] and H. Kaiju[1] *1. Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan; 2. Faculty of Engineering, Ibaraki University, Hitachi, Japan; 3. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan*

FK-03. **Withdrawn**

FK-04. **Growth and characterisation of superconducting Fe(Te,Se) thin films by pulsed laser deposition method.** *R. Kumar*[1] and G.D. Varma[1] *1. Physics, I.I.T. Roorkee, Roorkee, India*

FK-05. **Assessing the use of of magnetostrictive ellipse nanostructures for capture and release of superparagmagnetic beads in biomedical applications.** *M. Guevara*[1], Y. Hsiao[1], R.I. Khojah[2], A.C. Chavez[1], K. Fitzell[3], A. Kundu[1], D. Di Carlo[2], J.P. Chang[3], G. Carman[1] and C. Lynch[1] *1. Mechanical and Aerospace Engineering, UCLA, Los Angeles, CA, United States; 2. Bioengineering, UCLA, Los Angeles, CA, United States; 3. Chemical and Biomolecular Engineering, UCLA, Los Angeles, CA, United States*

FK-06. **Laser induced thermo-magnetic electromotive force in a TbCo/Pt hetero-structure wire.** T. Suzuki[1], K. Matsumoto[1], *S. Sumi*[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

FK-07. **Tunable Giant Magnetocapacitance in Single Layer Capacitive Device on Epitaxial Nickel Zinc Ferrite Thin Film.** *R. Joshi*[1], D. Roy[2], S. Singh[1], S. Dash[1] and P. Anil Kumar[3] *1. Physics, Central University of Karnataka, Kalaburagi, India; 2. Physics, Indian Institute of Technology Ropar, Ropar, India; 3. Physics, Indian Institute of Science, Bengaluru, India*

FK-08. **Spatial and Temporal Correlations of XY Macro Spins.** *R. Streubel*[1], N. Kent[1], S. Dhuey[2], A. Scholl[3], S. Kevan[3] and P. Fischer[1] *1. Materials Sciences Division, Lawrence Berkeley National Lab, Berkeley, CA, United States; 2. Molecular Foundry, Lawrence Berkeley National Lab, Berkeley, CA, United States; 3. Advanced Light Source, Lawrence Berkeley National Lab, Berkeley, CA, United States*

THURSDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session FL
MAGNETIZATION DYNAMICS III (Poster Session)

Claas Abert, Chair
Christian Doppler Laboratory for Advanced Magnetic Sensing and Materials, University of Vienna, Vienna, Austria

FL-01. **Studies of HAMR Recording by Hybrid Monte-Carlo Micromagnetics.** *J. Miao*[1] and D. Wei[1,2] *1. School of Materials Science and Engineering, Tsinghua University, Beijing, China; 2. College of Physics and Electronic Information, Inner Mongolia Normal University, Hohhot, China*

FL-02. **Magnetic Damping Constant of CoFeB/Pt Thin Films with Varying the Thicknesses of Pt and Insertion Layer of Al.** K. Wu[1], J. Mao[1], Y. Zuo[1], J. Yun[1], B. Cui[1], X. Zhang[1], Y. Wang[1], H. Shi[1] and *L. Xi*[1] *1. Key Laboratory for Magnetism and Magnetic Materials of Ministry of Education & School of Physical Science and Technology, Lanzhou University, Lanzhou, China*

FL-03. **Quantitative Evaluation of Errors in Calculation of the Demagnetization Tensor.** *M.J. Donahue*[1] and D.G. Porter[1] *1. Applied and Computational Mathematics Division, National Institute of Standards and Technology, Gaithersburg, MD, United States*

FL-04. **Thermally induced magnetization switching in FeGd ferrimagnetic thin films.** *Z. Fu*[1], Z. Zhang[2] and Y. Liu[1] *1. School of Physics Science and Engineering, Tongji University, Shanghai, China; 2. Department of Optical Science and Engineering, Fudan University, Shanghai, China*

FL-05. **Terahertz Spin Transfer Torque Oscillator of Synthetic Antiferromagnet.** H. Zhong[1], S. Qiao[2], S. Yan[1], H. Zhang[3], Y. Qin[3], L. Liang[2], D. Wei[2], Y. Zhao[1] and *S. Kang*[1] *1. School of Physics, Shandong University, Jinan 250100, China; 2. School of Opto-Electronic Engineering, Zaozhuang University, Zaozhuang 277160, China; 3. Department of Applied Physics, Shandong Agricultural University, Taian 271018, China*

FL-06. **Enhancing magnetic resonant frequency in coupled magnetic oscillators with tailored coupling strength.** *H. Chen*[1], Y. Chen[1], Y. Xie[1], T. Wang[1], A.F. Franco[2] and J. Xiao[1] *1. University of Delaware, Newark, DE, United States; 2. Universidad Técnica Federico Santa María, Valparaiso, Chile*

FL-07. **Ultra-low damping insulating magnetic thin films get perpendicular.** L. Soumah[1], N. Beaulieu[2], L. Qassym[3], C. Carrétéro[1], E. Jacquet[1], R. Lebourgeois[3], J. Ben Youssef[2], P. Bortolotti[1], V. Cros[1] and *A. Anane*[1] *1. Unité Mixte CNRS\ Thales et Université Paris Saclay, Palaiseau, France; 2. LABSTICC, UMR 6285 CNRS, Université de Bretagne Occidentale, Brest, France; 3. Thales Research and Technology, Palaiseau, France*

FL-08. **Compositional dependence of Gilbert damping in Fe_xRh_{1-x} thin films.** *T. Usami*[1,2], M. Itoh[2] and T. Taniyama[1,2] *1. Department of Physics, Nagoya University, Nagoya, Japan; 2. Laboratory for Materials and Structures, Tokyo Institute of Technology, Yokohama, Japan*

FL-09. **Antiferromagnetic Oscillators driven by Interface-generated Spin Currents.** *D. Lee*[1], B. Park[2] and K. Lee[1,3] *1. Department of Materials Science and Engineering, Korea University, Seoul 02841, The Republic of Korea; 2. Department of Materials Science and Engineering and KI for Nanocentury, KAIST, Daejeon 34141, The Republic of Korea; 3. KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul 02841, The Republic of Korea*

FL-10. **Topological and non-topological domain walls in helical magnets.** T. Nattermann[1] and *V. Pokrovsky*[2,3] *1. Institute of Theoretical Physics, University of Cologne, Cologne, Germany; 2. Department of Physics and Astronomy, Texas A&M University, College Station, TX, United States; 3. Landau Institute for Theoretical Physics, Chernogolovka, Russian Federation*

FL-11. **Non-Equilibrium Phase Transitions in One-Dimensional Spin Chains.** *A. Galda*[1,2] and V. Vinokur[2] *1. James Franck Institute, University of Chicago, Chicago, IL, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States*

FL-12. **Gyration dynamics in nπ magnetic configurations stabilized in weak PMA materials.** *S. Finizio*[1], S. Wintz[1,2], D. Bracher[1], E. Kirk[3,4], A.S. Semisalova[2], J. Förster[6], K. Zeissler[5], T. Weßels[7], M. Weigand[6], K. Lenz[2], A. Kleibert[1] and J. Raabe[1] *1. Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland; 2. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. Laboratory for Mesoscopic Systems, ETH Zürich, Zürich, Switzerland; 4. LMX, Paul Scherrer Institut, Villigen PSI, Switzerland; 5. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 6. Max-Planck-Institut für Intelligente Systeme, Stuttgart, Germany; 7. Forschungszentrum Jülich, Jülich, Germany*

Session FM
SPIN CALORITRONICS AND SPIN MECHATRONICS (Poster Session)

Wei Zhang, Chair
Oakland University, Rochester, MI, United States

FM-01. **Enhanced spin injection via spin Seebeck effect in $CoFe_2O_4$/C_{60}/Pt heterostructures.** *H. Nazari*[1], V. Kalappattil[1], R. Das[1], R. Geng[2], H. Luong[2], T. Pham[2], T. Nguyen[2], B. Sahu[3], P. Rajagiri[3], N. Venkataramani[3], S. Prasad[3], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Physics, University of Georgia, Athens, GA, United States; 3. Physics, Indian Institute of Technology, Mumbai, India*

FM-02. **Control of Magnetization Dynamics by Spin Nernst Torque.** *A. Bose*[2,1], A.S. Shukla[2], S.S. Bhuktare[2], S. Dutta[2], H. Singh[2] and A. Tulapurkar[2] *1. Dept. of Applied and Engineering Physics, Cornell University, Ithaca, NY, United States; 2. Dept. of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

FM-03. **Anisotropic magneto-Peltier effect and anomalous Ettingshausen effect in Ni thin films.** *R. Das*[1], R. Iguchi[1] and K. Uchida[1] *1. National Institute for Materials Science, Tsukuba 305-0047, Japan*

FM-04. **Impacts of perpendicular magnetic anisotropy of YIG on the spin Seebeck, spin Hall magnetoresistance and magnetic damping in YIG/Pt.** *V. Kalappattil*[1], R. Das[1], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States*

FM-05. **Evaluation of Spin Seebeck Effect in Single-crystal and Polycrystal $Y_3Fe_5O_{12}$ (YIG).** *A. Yamamoto*[1] and T. Kawahara[1] *1. Electrical Engineering, Tokyo University of Science, 6-3-1, Niijuku, Katsushika-ku, Japan*

FM-06. **A comparative study of spin Seebeck effect and anomalous Nernst effect in a ferromagnetic-metal/normal-metal bilayer system.** *A. De*[1], A. Ghosh[2], R. Mandal[1] and S. Nair[1] *1. Physics, Indian Institute of Science Education and Research, Pune, India; 2. National University of Singapore, Singapore, Singapore*

FM-07. **Thermal Transport Characterization by DC Planar Hall Measurements.** *P. Sahu*[1], J. Chen[2] and J. Wang[2,1] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

FM-08. **Withdrawn**

FM-09. **Mechanical generation of spin current via spin vorticity coupling in Cu, Pt and Ti thin films.** *Y. Kurimune*[1] and Y. Nozaki[1,2] *1. Department of Physics, Keio University, Yokohama-shi, Japan; 2. Center for Spintronics Research Network, Keio University, Yokohama-shi, Japan*

FM-10. **Generation of spin-motive force using surface acoustic waves.** *S. Negami*[1] and Y. Nozaki[1,2] *1. Department of Physics, Keio Univ., Yokohama, Japan; 2. Center of Spintronics Network, Keio Univ., Yokohama, Japan*

FM-11. **Spin Transport through Polyaniline Generated by Ferromagnetic Spin Pumping and Spin Seebeck Effects.** *J.B. Mendes*[1], O. Alves-Santos[1,2], J.P. Gomes[1], H.S. Assis[1], J.F. Felix[1,3], R. Rodriguez[4], A. Azevedo[2] and S.M. Rezende[2] *1. Physics Department, Universidade Federal de Viçosa, Viçosa, Brazil; 2. Physics Department, Universidade Federal de Pernambuco, Recife, Brazil; 3. Physics Department, Universidade de Brasília, Brasília, Brazil; 4. Physics Department, Pontifícia Universidad Católica de Chile, Santiago, Chile*

THURSDAY AFTERNOON 2:30 | EXHIBIT HALL A

Session FN

MAGNETIC INSTRUMENTATION AND CHARACTERIZATION II (Poster Session)

Michalis Charilaou, Co-Chair
University of Louisiana at Lafayette, Lafayette, LA, United States
Yu-Sheng Ou, Co-Chair
University of Delaware, Newark, DE, United States

FN-01. **Magnetic sensing of ellipsoidal inclusions in a medical Ti-6Al-4Valloy.** *H. Carreon*[1] *1. Materials, Universidad Michoacana, Morelia, Mexico*

FN-02. **Hysteretic measurements of magnetic materials in an alternating magnetic field (AMF).** R. Onodera[1], T. Kuroiwa[2], H. Yanagihara[2], M. Kin[3], H. Kura[4] and *E. Kita*[1,2] *1. National Institute of Technology, Ibaraki College, Hitachinaka, Japan; 2. Institute of Applied Physics, University of Tsukuba, Tsukuba, Japan; 3. Materials Engineering R&D Division, DENSO Corportation, Kariya, Japan; 4. Material R&I Div., DENSO Corporation, Nisshin, Japan*

FN-03. **Frequency optimization for sugar concentration measurement with open-ended coaxial probe method by using dielectric properties measurement.** R. Sumranbumrung[1], A. Siritaratiwat[1] and *A. Kruesubthaworn*[1] *1. Department of Electrical Engineering, Khon Kaen University, Khon Kaen, Thailand*

FN-04. **Analysis of Excitation Coil System in Electromagnetic Flowmeter for Making Uniform Magnetic Field.** *K. Kim*[1], S. Im[1] and G. Park[1] *1. Department of Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*

FN-05. **Effect of Mechanical Stress on Alternating Magnetic Properties of Silicon Steel Sheet.** *Y. Li*[1], Y. Dou[1], C. Zhang[1], A. Li[1] and S. Yue[1] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

FN-06. **Study of Mechanical Resonance Induced by Magnetostriction in Cyclic Structures Based on FeSi.** *J. Li*[1] *1. State Key Laboratory of Control and Simulation of Power System and Generation Equipments, Department of Electrical Engineering, Tsinghua University, Beijing, China*

FN-07. **Comprehensive Investigation of Core loss for Fe-Si Steel Sheet Under Both Alternating and Rotational Magnetizations Up to Kilohertz.** *S. Yue*[1], Y. Li[1], Q. Yang[1] and C. Zhang[1] *1. Electrical Engineering, Hebei University of Technology, Tianjin, China*

FN-08. **A Primary Standard for DC and AC Magnetic Field Based in Nuclear Magnetic Resonance.** *R.V. Martin*[1] *1. CTMetro, Instituto de Pesquisas Tecnológicas do Estado de São Paulo - IPT, São Paulo, Brazil*

FN-09. **Magnetic Imaging Drag Tester for Detection of High Frequency Magnetic Response by Contact-scanning of Magnetic Head Probe with HDD Head Preamplifier.** *Y. Miyamoto*[1], M. Okuda[1], M. Kawana[1] and N. Ishii[1] *1. Science & Technology Research Labs., NHK (Japan Broadcasting Corp.), Tokyo, Japan*

FN-10. **On the investigation of surface induced-residual stresses due to shot peening using needle probes technique.** *Y.A. Tene Deffo*[1], B. Gupta[2,3], B. Ducharne[2] and P. Tsafack[1] *1. Faculty of Engineering, Buea University, Buea, Cameroon; 2. LGEF, INSA LYON, Villeurbanne, France; 3. Elytmax, Tohoku University, Sendai, Japan*

FN-11. **Design and Optimization of a Resonant Reactive Shielding Coil in Two Wireless Power Transfer Systems.** *R. Li*[1], Y. Li[1], Q. Yang[2], P. Zhang[1] and Z. Yuan[1] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 2. Tianjin Key Laboratory of ATEEE, Tianjin Polytechnic University, Tianjin, China*

Session FO
TUNNELING MAGNETORESISTANCE, GIANT MAGNETORESISTANCE, HALL EFFECT AND RELATED EFFECTS (Poster Session)

Jeongmin Hong, Chair
Huazhong University of Science and Technology, Wuhan, China

FO-01. **Anomalous Hall effect induced spin Hall magnetoresistance in an antiferromagnetic Cr_2O_3/Ta bilayer.** *Y. Ji*[1], J. Miao[1], K. Meng[1], J. Chen[1], X. Xu[1], Y. Wu[1] and Y. Jiang[1] *1. Beijing Advanced Innovation Center for Materials Genome Engineering, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China., Beijing, China*

FO-02. **Large Anomalous Hall Effect in Antiferromagnetic Mn_3Sn Thin Films.** *T. Ikeda*[1], M. Tsunoda[2], M. Oogane[1], S. Oh[3], T. Morita[3] and Y. Ando[1] *1. Applied Physics, Tohoku University, Sendai, Japan; 2. Electronic Engineering, Tohoku University, Sendai, Japan; 3. ULVAC Inc., Tsukuba, Japan*

FO-03. **Anomalous Hall Effect in Epitaxial Thin Films of Mn_2VAl Full-Heusler Alloy.** *K. Fukuda*[1], M. Oogane[1], M. Tsunoda[2] and Y. Ando[1] *1. Applied Physics, Tohoku University, Sendai, Japan; 2. Electronic Engineering, Tohoku University, Sendai, Japan*

FO-04. **Impact of Ultra-thin Oxide Interlayers on Spin Hall Magnetoresistance in Pt/Fe_3O_4 Thin Films.** T. Pham[1,2], N. Do[1,2], Q. Nguyen[3], S. Cho[3] and *T. Kim*[1,2] *1. IBS-Center for Quantum Nanoscience, Ewha Womans University, Seoul, The Republic of Korea; 2. Physics, Ewha Womans University, Seoul, The Republic of Korea; 3. Physics, University of Ulsan, Ulsan, The Republic of Korea*

FO-05. **Temperature Dependent Magneto-transport Properties of MnAl Binary Alloy Thin Films.** *V. Barwal*[1], S. Chaudhary[1], S. Husain[1], N. Behera[2], A. Kumar[2] and P. Svedlindh[2] *1. Physics, Indian Institute of Technology, New Delhi, India; 2. Department of Engineering Sciences, Uppsala University, Uppsala, Sweden*

FO-06. **The Seebeck Effect and Joule Heating in CoFeB/MgO/CoFeB-based Perpendicular Magnetic Tunnel Junctions with Low Resistance Area Product.** *H. Lv*[1,2], J.F. Silva[1,2], D.C. Leitao[1,2], A. Silva[1], P.P. Freitas[1,3], S. Cardoso de Freitas[1,2], T. Kämpfe[4], S. Riedel[4], B. Ocker[5], J. Langer[5] and J. Wrona[5] *1. INESC - Microsistemas e Nanotecnologias, Lisbon, Portugal; 2. Instituto Superior Tecnico (IST), Lisbon University, Lisbon, Portugal; 3. International Iberian Nanotechnology Laboratory (INL), Braga, Portugal; 4. Fraunhofer Institute for Photonic Microsystems IPMS, Dresden, Germany; 5. Singulus Technologies AG, 63796 Kahl am Main, Germany*

FO-07. **TAMR in fully epitaxial magnetic tunnel junctions with different barriers.** B. Tao[1], L. Jiang[1], M. Hehn[2], D. Lacour[2], Y. Lu[2] and *X. Han*[2] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Institut Jean Lamour, CNRS-Université de Lorraine, Nancy, France*

FO-08. **Ultrahigh Tunneling-Magnetoresistance Ratios in Nitride-Based Perpendicular Magnetic Tunnel Junctions from First Principles.** B. Yang[1], L. Jiang[2], W. Chen[2], P. Tang[2], Y. Yan[1] and *X. Han*[2] *1. Department of Physics, Jilin University, Changchun, China; 2. Chinese Academy of Sciences, Institute of Physics, Beijing, China*

FO-09. **Magnetic Tunnel Junctions Based on Antiferromagnetic Coupled MnGa/Co_2MnSi Composite Electrodes.** *S. Mao*[1], J. Lu[1], X. Zhao[1] and J. Zhao[1] *1. Institute of semiconductors, Chinese Academy of Sciences, Beijing, China*

FO-10. **Study of free layer CoFeB thickness dependent magnetic tunneling junctions with perpendicular synthetic antiferromagnetic reference layer.** *Z. Lei*[1], Z. Guo[1], S. Yan[1], Z. Cao[1], Z. Zhou[1], Z. Li[1], W. Zhao[1] and Q. Leng[1] *1. Beihang-Geortek Joint Microelectronics Institute, Qingdao Research Institute, Beihang University, Qingdao, China*

THURSDAY AFTERNOON 2:30 — EXHIBIT HALL A

Session FP
HIGHLY FRUSTRATED MAGNETISM AND SPIN GLASSES II (Poster Session)

Christianne Beekman, Chair
Florida State/NHFML, Tallahassee, FL, United States

FP-01. **Longitudinal Resonance for Thin Film Ferromagnets with Random Anisotropy: A New Variable, A New Mode.** *W. Saslow*[2] and C. Sun[2,1] *1. Physics, Brown University, Providence, RI, United States; 2. Physics, Texas A&M University, College Station, TX, United States*

FP-02. **A neutron diffraction demonstration of the long-range magnetic order in the quasicrystal approximant $DyCd_6$.** *D. Ryan*[1], S. Cadogan[2], T. Kong[3], P.C. Canfield[3], A.I. Goldman[3] and A. Kreyssig[3] *1. Physics, McGill University, Montreal, QC, Canada; 2. School of Physical, Environmental and Mathematical Sciences, UNSW Canberra, Canberra, ACT, Australia; 3. Department of Physics and Astronomy, Iowa State University, Ames, IA, United States*

FP-03. **Frustration and multiple bands effects probed by Electron Spin Resonance in the $GdIn(Ni_xCu_{1-x})_4$ ($0.00 \leq x \leq 1.00$) intermetallic compounds.** S. Mercena[2], E. Mendonça[2], C.B. Jesus[2], J.C. Souza[1], C. Meneses[2], J. Duque[2] and *P. Pagliuso*[1] *1. IFGW, Unicamp, Campinas, Brazil; 2. UFS, São Cristovão - SE, Brazil*

FP-04. Anti-site disorder driven unusual magnetic properties in Sm_2NiMnO_6 double perovskite. *S. Majumder*[1], M. Tripathi[1], R. Choudhary[1] and D. Phase[1] *1. Thin Film Magnetism, UGC-DAE Consortium for Scientific Research, INDORE, India*

FP-05. Discovery of successive spin glass transitions involving transverse and longitudinal freezing in ordered $BaFe_{12}O_{19}$ hexaferrite due to anisotropic geometrical frustration. *K. Kumar*[1], D. Pandey[1] and A. Senyshyn[2] *1. School of Material Science & Technology, Indian Institute of Technology (Banaras Hindu University), Varanasi, India; 2. Forschungsneutronenquelle Heinze Maier-Leibnitz (FRM-II), Technische Universitat Munchen, Munchen, Germany*

FP-06. Suppression of Spin Glass behaviour in Phase Separated $La_{0.22}Pr_{0.40}Ca_{0.38}MnO_3$ by Nanostructuring. *S. Kumari*[1], D.S. Raghav[2], P.K. Siwach[1], G.D. Varma[2] and H.K. Singh[1] *1. Time and Frequency and Electrical and Electronics Metrology Division, CSIR National Physical Laboratory, Delhi, India; 2. Physics, IIT Roorkee, Roorkee, India*

FP-07. Novel Frustrated Magnetic Systems Created by Stepwise Nanosphere Lithography. *B. Myint*[1] and V. Ng[1] *1. Information Storage Materials Laboratory, Electrical and Computer Engineering Department, National University of Singapore, Singapore, Singapore*

FP-08. Magnetic Characterization of Amorphous YIG for Spin Transport. *M. Roos*[1], D. Wesenberg[1], T. Liu[2], M. Wu[2], F. Hellman[3] and B.L. Zink[1] *1. University of Denver, Denver, CO, United States; 2. Colorado State University, Fort Collins, CO, United States; 3. Physics, University of California, Berkeley, Berkeley, CA, United States*

FP-09. Study of A-Site disorder dependent structural properties and magnetic ordering in the polycrystalline perovskite $Sm_{0.5}Ca_{0.5-x}Sr_xMnO_3$. *M.A. Bally*[1], P. Svedlindh[2], P. Nordblad[2], M. Islam[1], M.A. Khan[1], R. Mathieu[2], M.S. Andersson[2] and S. Ivanov[2] *1. Physics, Bangladesh University of Engineering and Technology (BUET)., Dhaka, Bangladesh; 2. Engineering Science, Uppsala University, Uppsala, Sweden*

FP-10. Magnetism and transport properties of Mn doping in Sr_2IrO_4. S. Huang[1,2], G. Zhou[1], Z. Zhang[1], X. Yang[1], F. Duan[1], F. Zhang[1], A. Zhang[3] and *X. Wu*[1] *1. State Key Lab of Solid State Microstructures, School of Physics, Nanjing University, Nanjing, China; 2. School of Physics and Technology, Nanjing Normal University, Nanjing, China; 3. College of Science, Hohai University, Nanjing, China*

Session FQ
MOTORS: MODELING AND SIMULATIONS VI (Poster Session)

Metin Aydin, Chair
Kocaeli University, Kocaeli, Turkey

FQ-01. **Comparative study for a novel dual-stator composite-rotor synchronous machine.** Y. Zhang[1], S. McLoone[1] and *F. Zhang*[2] *1. Queens University Belfast, Belfast, United Kingdom; 2. Shenyang University of Technology, Shenyang, China*

FQ-02. **A Novel Transverse-flux Machine with Dual-tooth-slot Configuration for Direct-drive Applications.** *X. Yang*[1], B. Kou[1], J. Luo[1], H. Zhang[1] and Y. Zhou[1] *1. Harbin Institute of Technology, Harbin, China*

FQ-03. **A study on design of magnet gear for improve magnetic field loss and transmission torque characteristics.** *M. Kim*[1], S. Lee[1], E. Park[2] and Y. Kim[2] *1. Korea Institute of Industrial Technology, Gwangju, The Republic of Korea; 2. Chosun University, Gwangju, The Republic of Korea*

FQ-04. **Design of High Torque Density Magnet Coupling Using Halbach Magnet Array Structure.** H. Liu[1], *H. Lee*[2] and J. Lee[1] *1. Hanyang Univ, Seoul, The Republic of Korea; 2. Busan Institue of Science & Technology, Busan, The Republic of Korea*

FQ-05. **A Novel Approach for Power Factor Improvement in Dual-Stator Vernier Permanent Magnet Machine.** *Q. Lin*[1], S. Niu[1] and W. Fu[1] *1. The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

FQ-06. **Torque Enhancement for Flux Intensifying PMa-SynRM Using Flux Barrier Displacements.** *D. Ngo*[1] and M. Hsieh[1] *1. National Cheng Kung University, Tainan, Taiwan*

FQ-07. **A Study on the Effect of Eddy Current Loss Variation by the Direction of Magnet Division on Demagnetization Characteristics and Vibration.** *B. Kim*[1], J. Lee[1], D. Lee[1], W. Lee[1], J. Moon[1] and D. Kang[1] *1. Keimyung University, Daegu, The Republic of Korea*

FQ-08. **Electromagnetic Characteristics Comparison and Analysis of Surface-Mounted Permanent Magnet Vernier Machines With Different Stator Tooth Topologies.** *F. Chai*[1] and Y. Yu[1] *1. Harbin Institute of Technology, Harbin, China*

FQ-09. **Axial Field 'Pseudo' Direct Drive Electrical Machines.** G. Cooke[1], R.S. Dragan[1] and *K. Atallah*[2] *1. Magnomatics Ltd, Sheffield, United Kingdom; 2. Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom*

FQ-10. **Analysis of a Novel Hybrid-PM Variable-Flux Machine Using New Magnet Material CeFeB.** *M. Wang*[1], P. Zheng[1], L. Cheng[1], S. Zhang[1], G. Qiao[1] and F. Liu[1] *1. Harbin Institute of Technology, Harbin, China*

THURSDAY
AFTERNOON
2:30

EXHIBIT HALL A

Session FR
MOTORS: MODELING AND SIMULATIONS VII (Poster Session)

Lijian Wu, Chair
Zhejiang University, Zhejiang, China

FR-01. **Electromagnetic and mechanical analyses of a high-speed permanent-magnet machine with improved rotor structure.** *Z. Song*[1] *1. Beijing Institute of Automation Control Equipment, Beijing, China*

FR-02. **Analytical Computation of Inductance for Spoke-Type Permanent Magnet Synchronous Motor Accounting for Saturation.** *P. Liang*[1,2], W. Liu[1,2], K. Shen[1,2] and F. Chai[3] *1. Department of Electrical Engineering, Northwestern Polytechnical University, Xi'an, China; 2. Shaanxi Key Laboratory of Small & Special Electrical Machine and Drive Technology, Xi'an, China; 3. Department of Electrical Engineering, Harbin Institute of Technology, Harbin, China*

FR-03. **Study of High Speed Reluctance Machine with Sensitivity Analysis.** Y. Wang[1], *J. Shen*[1], Y. Sun[1] and L. Yingqian[1] *1. Electrical Engineering, Zhejiang University, Hangzhou, China*

FR-04. **Performance of a Hybrid-Permanent-Magnet Variable-Flux Machine over Wide-Speed Range.** *P. Zheng*[1], F. Liu[1], X. Ma[2], L. Cheng[1], M. Wang[1] and G. Qiao[1] *1. Harbin Institute of Technology, Harbin, China; 2. State Grid Liaoning Electric Power Co., Ltd. Dalian Power Supply Company, Dalian, China*

FR-05. **Vibration Analysis of Switched Reluctance Motor Considering Magnetostriction.** *R. Yan*[1,2], J. Chen[1,2] and Y. Gao[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, School of Electrical Engineering, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

FR-06. **Modeling and Analysis of Axial Flux Permanent Magnet Machines with Coexistence of Rotor Radial Deviation and Angular Eccentricity.** *W. Tong*[1], S. Dai[1], S. Wu[1] and R. Tang[1] *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

FR-07. **Cogging Torque and Torque Ripple Reduction of Novel Dual-Stator Field Modulation Machine Using Hybrid Magnet.** H. Wang[1,2], S. Fang[1], H. Yang[1], *Z. Pan*[1] and H. Lin[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC), University of Wisconsin-Madison, Madison, WI, United States*

FR-08. **Design and analysis of an improved flux intensifying PM embedded salient pole wind generator.** *Y. Guo*[1], P. Jin[1] and H. Yang[2] *1. College of Energy and Electrical Enginnering, Hohai University, Nanjing, China; 2. School of Electrical Engineering, Southeast University, Nanjing, China*

FR-09. **Thermal- and Magnetic-Field Analysis of Large-Scale Permanent Magnet Embedded Salient Pole Wind Generator by Permeable Coupling Method.** *Y. Guo*[1] *1. Hohai University, Nanjing, China*

THURSDAY
EVENING
6:00

SALON 2

Session XA

EVENING SESSION: FOREFRONT ISSUES AND NEW OPPORTUNITIES IN MAGNETIC MATERIALS

Laura H. Lewis, Co-Chair
Northeastern University, Boston, MA, United States
Steve May, Co-Chair
Drexel University, Philadelphia, PA, United States

6:00

XA-01. **2D Magnets and Heterostructures.** ***(Invited)*** *X. Xu*[1] *1. Department of Physics, Department of Materials Science and Engineering, University of Washington, Seattle, WA, United States*

6:45

XA-02. **What Will We Make Magnets From?** ***(Invited)*** *A.H. King*[1] *1. Department of Materials Science & Engineering, Iowa State University, Ames, IA, United States*

Session GA

ENERGY HARVESTING AND TRANSFORMATIONS BASED ON MAGNETIC MATERIALS

Hari Srikanth, Chair
University of South Florida, Tampa, FL, United States

8:30

GA-01. **High Power Magnetostrictive Vibrational Power Generator for Battery-free IoT.** ***(Invited)*** *T. Ueno*[1] *1. Kanazawa University, Kanazawa-city, Japan*

9:06

GA-02. **MEMS based vibrational energy harvesting and conversion employing micro/nano magnetics.** ***(Invited)*** *S. Roy*[1,2] *1. Tyndall National Institute, Cork, Ireland; 2. Physics, University College Cork, Cork, Ireland*

9:42

GA-03. **Stress induced domain wall motion in FeCo based magnetic microwires for realization of energy harvesting.** ***(Invited)*** *S. Piramanayagam*[1], X. Liu[2], S. Bhatti[1] and C. Ma[2] *1. Division of PAP, SPMS, Nanyang Technological University, Singapore, Singapore; 2. Department of ECE, Shinshu University, Nagano, Japan*

10:18

GA-04. **Generating Electricity from Waste Heat using Magnetostructural Materials.** ***(Invited)*** *E. Brück*[1], M. Maschek[1], X. You[1] and N. van Dijk[1] *1. TU Delft, Delft, Netherlands*

10:54

GA-05. **A thermomagnetic generator with novel magnetic field topology - which thermomagnetic material works best?** ***(Invited)*** *A. Waske*[1,2], D. Dzekan[1,3], K. Sellschopp[4,1], D. Berger[1], A. Stork[1,3], K. Nielsch[1,3] and S. Faehler[1] *1. IFW Dresden, Dresden, Germany; 2. Federal Institute for Materials Research and Testing (BAM), Berlin, Germany; 3. Institute of Materials Science, TU Dresden, Dresden, Germany; 4. Technische Universität Hamburg, Hamburg, Germany*

Session GB
ANTIFERROMAGNETIC SPINTRONICS
Martina Ahlberg, Chair
University of Gothenburg, Gothenburg, Sweden

8:30

GB-01. **Novel functions observed in a topological antiferromagnet Mn_3Sn. *(Invited)*** *Y. Otani*[1,2] *1. ISSP, University of Tokyo, Kashiwa, Japan; 2. CEMS, RIKEN, Wako, Japan*

9:06

GB-02. **Imaging magnetic order in antiferromagnetic materials with a scanning-NV magnetometer.** M. Akthar[1], A. Haykal[1], J. Fisher[2], I. Gross[1], V. Garcia[2], S. Chouaieb[1], C. Carrétéro[2], A. Barthelemy[2], P. Maletinsky[3], M. Viret[4], J. Chauleau[4], N. Jaouen[5], M. Bibes[2], *S. Fusil*[2] and V. Jacques[1] *1. Laboratoire Charles Coulomb, CNRS and Uni. Montpellier, Montpellier, France; 2. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 3. Basel University, Basel, Switzerland; 4. CEA Saclay, Gif-sur-Yvette, France; 5. Synchrotron SOLEIL, Gif-sur-Yvette, France*

9:18

GB-03. **Chirality Conservation and Spin Current Driven Dichroism in Antiferromagnetic Insulators.** I. Proskurin[1,2], *R. Stamps*[1], A. Ovchinnikov[2,4] and J. Kishine[3] *1. Physics & Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. Institute of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, Russian Federation; 3. Division of Natural and Environmental Sciences, The Open University of Japan, Chiba, Japan; 4. Institute for Metal Physics, Ekaterinburg, Russian Federation*

9:30

GB-04. **Generation of the Propagating Domain Walls in Antiferromagnets by Spin Currents.** *R. Khymyn*[1], V. Tyberkevych[2], A.N. Slavin[2] and J. Åkerman[1,3] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Department of Physics, Oakland University, Rochester, MI, United States; 3. Materials Physics, School of ICT, KTH Royal Institute of Technology, Kista, Sweden*

9:42

GB-05. **Spin orbit torque effects on (100) oriented antiferromagnet $IrMn_3$.** *V. Karakas*[1,2], S. Lendinez[2], H. Saglam[2,3], Y. Li[2,4], M. Vogel[2], J. Pearson[2], R. Divan[5], L. Yuzi[6], J. Connell[2], W. Zhang[4,2], V. Novosad[2], A. Hoffmann[2] and O. Ozatay[1,2] *1. Physics, Bogazici University, Istanbul, Turkey; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 3. Department of Physics, IIT, Chicago, IL, United States; 4. Department of Physics, Oakland University, Rochester, MI, United States; 5. Ctr Nanoscale Mat, Argonne National Laboratory, Lemont, IL, United States; 6. Advanced Photon Source, Argonne National Laboratory, Lemont, IL, United States*

9:54

GB-06. **Strain Control of the Néel Vector in Antiferromagnetic FeMn.** *A. Barra*[1], L. Baldrati[2], R. Lebrun[2], P. Shirazi[3], A. Ross[2,4], M. Kläui[2,4] and G. Carman[1] *1. Department of Mechanical Engineering, University of California, Los Angeles, Los Angeles, CA, United States; 2. Institute for Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 3. Department of Materials Science, University of California, Los Angeles, Los Angeles, CA, United States; 4. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany*

10:06

GB-07. **Strong orientation dependent spin-orbit torque and synaptic functional application in antiferromagnet Mn_2Au.** *X. Zhou*[1], J. Zhang[2], X. Chen[1], F. Li[1] and C. Song[1] *1. School of Materials Science and Engineering, Tsinghua University, Beijing, China; 2. Huazhong University of Science and Technology, Wuhan, China*

10:18

GB-08. **Evidence of resistive switching into a dynamical state in antiferromagnetic iridates.** *M.C. Williamson*[1,2], S. Shen[1,2], G. Cao[3], J. Zhou[2], J.B. Goodenough[2] and M. Tsoi[1,2] *1. Physics, The University of Texas at Austin, Austin, TX, United States; 2. Texas Materials Institute, Austin, TX, United States; 3. Physics, University of Colorado Boulder, Boulder, CO, United States*

10:30

GB-09. **Room-temperature skyrmions in an antiferromagnet-based heterostructure.** *G. Yu*[1,2], A. Jenkins[3], X. Ma[4], S. Razavi[2], G. Yin[2], Q. Shao[2], H. Wu[2], W. Jiang[5], X. Han[1], X. Li[4], A. Jayich[3] and K. Wang[2] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. UCLA-Electrical Engineering, Los Angele, CA, United States; 3. Department of Physics, University of California, Santa Barbara, Santa Barbara, CA, United States; 4. Department of Physics, The University of Texas at Austin, Austin, TX, United States; 5. State Key Laboratory of Low-Dimensional Quantum Physics and Department of Physics, Tsinghua University, Beijing, China*

10:42

GB-10. **Spin Seebeck imaging of spin-torque switching in antiferromagnetic Pt/NiO/Pt heterostructures.** *I. Gray*[1,7], T. Moriyama[2], N. Sivadas[1], B.J. Kirby[4], R. Need[4], D. Low[1], G.M. Stiehl[5], J. Heron[6], D. Ralph[5,7], K. Nowack[5,7], T. Ono[2] and G. Fuchs[1,7] *1. Applied and Engineering Physics, Cornell University, Ithaca, NY, United States; 2. Institute for Chemical Research, Kyoto University, Uji, Japan; 4. NIST Center for Neutron Research, National Institute for Standards and Technology, Gaithersburg, MD, United States; 5. Department of Physics, Cornell University, Ithaca, NY, United States; 6. Department of Materials Science and Engineering, University of Michigan, Ann Arbor, MI, United States; 7. Kavli Institute for Nanoscale Science, Ithaca, NY, United States*

10:54

GB-11. **All-magnonic switching in an insulating ferromagnet/antiferromagnet/ferromagnet trilayer.** *R. Cheng*[1,2], D. Xiao[2] and J. Zhu[3,2] *1. Electrical and Computer Engineering, University of Californai - Riverside, Riverside, CA, United States; 2. Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

11:06

GB-12. **Complex magnetic anisotropy and relaxation dynamics in $IrMn_3$.** S. Jenkins[1], R.W. Chantrell[1] and *R.F. Evans*[1] *1. Department of Physics, University of York, York, United Kingdom*

11:18

GB-13. **Spin Transport Properties of FeRh Across its Magnetic Phase Transition.** *H. Saglam*[1,2], C. Liu[1], Y. Li[3,1], D. Hong[1], V. Karakas[1,4], O. Ozatay[1,4], J. Pearson[1], W. Zhang[3,1], A. Bhattacharya[1] and A. Hoffmann[1] *1. Material Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Department of Physics, Illinois Institute of Technology, Chicago, IL, United States; 3. Department of Physics, Oakland University, Rochester, MI, United States; 4. Department of Physics, Bogazici University, Istanbul, Turkey*

FRIDAY MORNING 8:30 — SALON 1

Session GC
TUNNELING MAGNETORESISTANCE AND TUNNELING ANISOTROPIC MAGNETORESISTANCE
Saima Siddiqui, Chair
MIT, Cambridge, MA, United States

8:30

GC-01. **Observation of spin-dependent resonant tunneling in an Fe quantum well detected by carriers injected from a *p*-type Ge semiconductor electrode.** *R. Suzuki*[1], Y.K. Wakabayashi[1], K. Okamoto[1], M. Tanaka[1] and S. Ohya[1] *1. The University of Tokyo, Tokyo, Japan*

8:42

GC-02. **Nonmagnet-Barrier Interface Drives Tunneling Anisotropic Magnetoresistance.** *P. Risius*[1], C. Mahr[1], M. Czerner[1] and C. Heiliger[1] *1. Institute for Theoretical Physics, Justus Liebig University Giessen, Gießen, Germany*

8:54

GC-03. **Investigation of Transport Property of MgO-based Magnetic Tunnel Junction with Vacancies and Grain Boundaries by First-principles Calculations.** *H. Kawai*[1], Y. Nakasaki[1], T. Daibou[1], T. Ishihara[1], T. Kai[1] and J. Ito[1] *1. Institute of Memory Technology Research & Development, Toshiba Memory Corporation, Kawasaki, Japan*

9:06

GC-04. **Low-resistive magnetic tunnel junction with chalcopyrite Cu(In,Ga)Se_2 tunneling barrier.** *S. Kasai*[1], K. Mukaiyama[1], H. Sepehri-Amin[1], T. Ohkubo[1] and K. Hono[1,2] *1. National Institute for Materials Science, Tsukoba, Japan; 2. University of Tsukuba, Tsukuba, Japan*

9:18

GC-05. **Large Tunnel Rectification Magnetoresistance in Engineered Device Consisted of MgO-MTJ and Diode.** *K. Zhang*[1,2], Y. Zhang[1,2], K. Cao[1,2], W. Cai[1,2], Z. Zheng[1,2], Z. Zhang[1,2] and W. Zhao[1,2] *1. School of Electrical and Information Engineering, Beihang University, Beijing, China; 2. Fert Beijing Institute, Beihang University, Beijing, China*

9:30

GC-06. **Oscillatory dependence of both tunnel magnetoresistance and tunnel anisotropic magnetoresistance on the barrier thickness in Fe/$MgAl_2O_4$/Fe(001) junctions.** M. Belmoubarik[1], M. Al-Mahdawi[1], *H. Sukegawa*[1] and S. Mitani[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

9:42

GC-07. **Bulk perpendicular $L1_0$-FePd spintronic devices for ultralow-energy spin memory and computing applications.** ***(Invited)*** *D. Zhang*[1], C. Sun[2], M. Bapna[3], Z. Zhao[1], P. Voyles[2], S. Majetich[3] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Department of Materials Science and Engineering, University of Wisconsin-Madison, Madison, WI, United States; 3. Department of Physics, Carnegie Mellon University, Pittsburgh, PA, United States*

10:18

GC-08. **Strong modulation of finite-bias tunnel magnetoresistance due to quantum well states in Cr/Fe/$MgAl_2O_4$/Fe(001) junctions.** *Q. Xiang*[1,2], H. Sukegawa[1], M. Belmoubarik[1], M. Al-Mahdawi[1], T. Scheike[1], S. Kasai[1], Y. Miura[1] and S. Mitani[1,2] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan*

10:30

GC-09. **Tunnel magnetoresistance and electric field effect on large perpendicular magnetic anisotropy observed in magnetic tunnel junctions with a nearly-zero moment Mn nano-layer electrode.** *K. Suzuki*[1,2], S. Kimura[3], H. Kubota[4] and S. Mizukami[1,2] *1. WPI-AIMR, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. IMR High Field Laboratory for Superconducting Materials, Tohoku University, Sendai, Japan; 4. Spintronics Research Center, AIST, Tsukuba, Japan*

10:42

GC-10. **Magnetization dynamics for the equiatomic Heusler CoFeCrAl alloy epitaxial films and spin-dependent transport in their magnetic tunnel junctions.** *T. Tsuchiya*[1,2], T. Roy[3], K. Elphick[4], L. Bainsla[5], M. Tsujikawa[3,2], M. Shirai[3,2], A. Hirohata[4] and S. Mizukami[5,2] *1. Center for Science and Innovation in Spintronics (Core Research Center), Tohoku University, Sendai, Japan; 2. Center for Spintonics Research Network, Tohoku University, Sendai, Japan; 3. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 4. Department of Electronics, The University of York, York, United Kingdom; 5. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan*

10:54

GC-11. **First Principle Calculation of Scandium Nitride Magnetic Tunnel Junctions.** *S. Karki*[1], D. Marshall[2] and J.C. Incorvia[1] *1. Electrical and Computer Engineering, UT Austin, Austin, TX, United States; 2. TAE Technologies, San Francisco, CA, United States*

11:06

GC-12. **High quality spinel $MgAl_2O_4$ tunnel barrier grown by controlled reactive sputtering.** *K. Nakada*[1], S. Ichikawa[1], X. Xu[2], H. Sukegawa[2], T. Ohkubo[2], K. Hono[2] and S. Mitani[2] *1. Advanced Products Development Center, TDK Corporation, Ichikawa, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan*

11:18

GC-13. **Investigation of cap-metal dependence for improvement of free layer characteristics in magnetic-tunnel-junctions.** *H. Tomita*[1,2], K. Nakamura[1], Y. Tanaka[1,2], K. Nagasaka[1,2], K. Ando[3], S. Bosu[1,2], A. Gomi[1], A. Fukushima[2], H. Kubota[2], K. Yakushiji[2], S. Yuasa[2], H. Maehara[3,2] and N. Watanabe[1] *1. Tokyo Electron Technology Solutions Limited, Nirasaki, Japan; 2. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 3. Tokyo Electron Limited, Nirasaki, Japan*

Session GD
SPIN-ORBIT TORQUE AND SPIN INJECTION DEVICES

Axel Hoffmann, Chair
Argonne National Laboratory, Lemont, IL, United States

8:30

GD-01. **Reliable, sub-nanosecond spin-orbit torque switching of three terminal magnetic tunnel junctions with in-plane magnetic anisotropy.** *S. Shi*[1], L. Zhu[1], D. Ralph[2] and R. Buhrman[1] *1. Applied and Engineering Physics, Cornell University, Ithaca, NY, United States; 2. Department of Physics, Cornell University, Ithaca, NY, United States*

8:42

GD-02. **Switching Behavior of an Etch-Stop-On-MgO-Barrier Spin-Orbit Torque MRAM Cell.** *C. Pai*[1], S. Rahaman[2], I. Wang[2] and T. Chen[1] *1. Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; 2. Electronic and Optoelectronic System Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan*

8:54

GD-03. **Spin-Orbit Torques Generated Through a Tunnel Barrier Interface.** *A. Bose*[1], J. Gibbons[2], R.C. Tapping[1], S. Shi[1], D. Ralph[2] and R. Buhrman[1] *1. Dept. of Applied and Engineering Physics, Cornell University, Ithaca, NY, United States; 2. Dept. of Physics, Cornell University, Ithaca, NY, United States*

9:06

GD-04. **Spin orbit torque switching process with non-uniform micromagnetic states in three terminal devices.** *J. Zhang*[1], T. Phung[2], C. Garg[2], Y. Jiang[1] and S. Parkin[2] *1. University of Science and Technology Beijing, Beijing, China; 2. IBM Almaden Research Center, San Jose, CA, United States*

9:18

GD-05. **Direct measurement of the two components of the spin-orbit-torque (SOT) in NiFe/Pt bilayers by an AMR-based Wheatstone bridge.** A. Jouy[1,3], T. Dang[2], J. George[1], D. Vissiere[3], S. Collin[2], M. Mansour[1] and *H. Jaffres*[2] *1. Laboratoire de Physique des Plasmas, Ecole Polytechnique, Palaiseau, France; 2. Thales Research & Technology, Unité Mixte de Physique CNRS-Thales, Palaiseau, France; 3. SYSNAV, Vernon, France*

9:30

GD-06. **The role of damping in perpendicular spin-orbit-torque MRAM.** *C. Abert*[1], F. Bruckner[1], C. Vogler[1] and D. Suess[1] *1. University of Vienna, Wien, Austria*

9:42

GD-07. Design Rules for Deeply Scalable Spin-Orbit Magnetic Tunnel Junctions. *M. Kazemi*[1] and M. Bocko[1,2] *1. Electrical Engineering, University of Rochester, Rochester, NY, United States; 2. Physics and Astronomy, University of Rochester, Rochester, NY, United States*

9:54

GD-08. Strain-mediated spin-orbit torque switching for magnetic memory. *Q. Wang*[1], J. Lille[2], P. Braganca[2], A. Bogdanov[2], H. Wu[1], J.P. Domann[3], A. Barra[1], G. Yu[4,1], K. Wang[1], J.A. Katine[2] and G. Carman[1] *1. University of California, Los Angeles, Los Angeles, CA, United States; 2. Western Digital Corporation, San Jose, CA, United States; 3. Virginia Tech, Blacksburg, VA, United States; 4. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

10:06

GD-09. Novel High-Speed Nonvolatile Logging Memory using Voltage Control Spintronics Memory for IoT Edge to Cloud Servers. *S. Takaya*[1], K. Ikegami[1], S. Takeda[1], S. Fujita[1], T. Inokuchi[1], N. Shimomura[1], H. Yoda[1] and A. Kurobe[1] *1. Corporate R&D Center, Toshiba Corporation, Kawasaki, Japan*

10:18

GD-10. Real-Time Observation of Fast and Highly Reliable Magnetization Switching in Voltage-Control Spintronics Memory (VoCSM). *T. Inokuchi*[1], H. Yoda[1], K. Koi[1], N. Shimomura[1], Y. Ohsawa[1], Y. Kato[1], S. Shirotori[1], M. Shimizu[1], H. Sugiyama[1], S. Oikawa[1], B. Altansargai[1] and A. Kurobe[1] *1. Corporate R&D Center, Toshiba Corporation, Kawasaki, Japan*

10:30

GD-11. Comparison of Spin Transfer Torque and Spin Orbit Torque in a Superparamagnetic Tunnel Junction. *B. Parks*[1], T. Wong[1], S. Majetich[1], Y. Wen[2], Q. Zhang[2] and X. Zhang[2] *1. Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Physical Science and Engineering Division, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

10:42

GD-12. Room-temperature operation of a vertical spin field-effect transistor with an oxide semiconductor GaO_x channel layer. *S. Ohya*[1,5], T. Kanaki[1], S. Matsumoto[1], S. Narayananellore[2], H. Saito[2], Y. Iwasa[3,4] and M. Tanaka[1,5] *1. Department of Electrical Engineering and Information Systems, The University of Tokyo, Tokyo, Japan; 2. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 3. QPEC and Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 4. RIKEN Center for Emergent Matter Science, Wako, Japan; 5. Center for Spintronics Research Network (CSRN), The University of Tokyo, Tokyo, Japan*

10:54

GD-13. **Fe/MgO tunnel contacts with 90% spin filtering in Si-based nonlocal devices.** *A.M. Spiesser*[1], Y. Fujita[1], H. Saito[1], S. Yuasa[1] and R. Jansen[1] *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

11:06

GD-14. **Asymmetric distortion of astroid curve with current bias in nanoscale magnetic tunnel junction.** *J. Igarashi*[1], S. Kanai[1,4], M. Shinozaki[1], J. Llandro[1,2], H. Sato[3,2], S. Fukami[1,4] and H. Ohno[1,4] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 4. Center for Spintronics Integrated Systems, Tohoku University, Sendai, Japan*

11:18

GD-15. **Exceptional Points in Classical Spin Dynamics.** *A. Galda*[1,2] and V. Vinokur[2] *1. James Franck Institute, University of Chicago, Chicago, IL, United States; 2. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States*

FRIDAY MORNING 8:30 — VIRGINIA

Session GE

MOTORS APPLICATIONS, ACTUATORS, SHIELDING AND LEVITATION

Hongbin Yu, Chair

Arizona State University, Tempe, AZ, United States

8:30

GE-01. **Core losses of a permanent magnet synchronous motor with nanocrystalline cores under inverter and sinusoidal excitations.** *A. Yao*[1], T. Sugimoto[2] and K. Fujisaki[2] *1. Department of Electrical and Computer Engineering, Toyama Prefectural University, Imizu, Japan; 2. Toyota Technological Institute, Nagoya, Japan*

8:42

GE-02. **Three Pole Combined Radial Axial Magnetic Bearing for Bearingless Motors.** *H. Gjemdal*[1] and E.L. Severson[2] *1. Electric Power Engineering, Norwegian Institute for Science and Technology, Trondheim, Norway; 2. Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI, United States*

8:54

GE-03. **A Novel Assembled Permeable Retaining Sleeve for Improving Performance of High Speed PM Synchronous Machine.** *Z. Zhu*[1], Y. Huang[1], F. Peng[1] and B. Guo[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

9:06

GE-04. **Soft Magnetic Materials. A Survey of Contemporary Developments in Electric Machines. *(Invited)*** *S. Sprague*[1], A. Krings[2], A. Boglietti[3] and A. Cavagnino[3] *1. Proto Lam, LLC, Santa Fe Springs, CA, United States; 2. FEV Europe, Gmbh, Aachen, Germany; 3. Politecnico di Torino, Torino, Italy*

9:42

GE-05. **Design and Analysis of Single-Transmitter Multiple-Frequency Wireless Motor Drives.** *C. Jiang*[1], K. Chau[1], C. Lee[2], W. Han[1] and W. Liu[1] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong, Hong Kong; 2. Research Laboratory of Electronics, Massachusetts Institute of Technology, Boston, MA, United States*

9:54

GE-06. **Investigation on Interior Permanent Magnet Synchronous Machines with Dysprosium free Magnets and Magnets Recycling Concept for Hybrid Electrical Vehicle Applications.** *Z. Li*[1,2], A. Kedous-Lebouc[1], J. Dubus[2], J. Legranger[2] and R. Fratila[2] *1. G2Elab, Univ. Grenoble Alpes, Grenoble, France; 2. Electrical Motor Equipment, Valeo, Creteil, France*

10:06

GE-07. **Design and Feasibility Assessments of a Flux-switching Permanent-magnet Motor for Alternative Exoskeleton System Applications.** *C. Liu*[1], Y. Wu[1], C. Hwang[2] and R. Lee[3] *1. Department of Electrical Engineering, National Sun Yat-Sen University, Kaohsiung, Taiwan; 2. Department of Electrical Engineering, Feng Chia University, Taichung, Taiwan; 3. NaRoller Electronics Corporation, Taoyuan, Taiwan*

10:18

GE-08. **Consequent-Pole PM Machine with Unequal Number of Coil Turns for Low Even Order Harmonics in Back-EMFs.** *F. Li*[1], K. Wang[1], H. Sun[1] and J. Li[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

10:30

GE-09. **Comparing the Torque Density Performance of a Series and a Nested Magnetically Geared Generator.** J. Bird[1] and *H. Baninajar*[1] *1. Electrical and Computer Engineering, Portland State University, Portland, OR, United States*

10:42

GE-10. **Torque and Suspension Force Characteristics of Consequent Pole Type Bearingless Vernier Motor.** *K. Minami*[1], N. Tada[1], K. Hijikata[1] and Y. Tanaka[1] *1. Tokyo City University, Tokyo, Japan*

10:54

GE-11. **Rotor Flux-Barriers Designs of Torque Ripple Reduction in a Multi-layered IPM Machine for EV Applications.** *M. Xie*[1] and S. Zhu[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

11:06

GE-12. **Study on Characteristics of Electromagnetic Guidance Forces of Superconducting Maglev Vehicles.** *T. Yonezu*[1], K. Watanabe[1], E. Suzuki[1] and T. Sasakawa[1] *1. Railway Technical Research Institute, Tokyo, Japan*

11:18

GE-13. **Indirect Optomechanical Actuation using the Diamagnetic Properties of Pyrolytic Graphite.** *M. Ewall-Wice*[1], K. DeLawder[1], S.R. Montgomery[2], P.J. Joyce[3], C. Brownell[3] and H. ElBidweihy[1] *1. Electrical and Computer Engineering Department, United States Naval Academy, Annapolis, MD, United States; 2. Physics Department, United States Naval Academy, Annapolis, MD, United States; 3. Mechanical Engineering, United States Naval Academy, Annapolis, MD, United States*

FRIDAY
MORNING
8:30

DELAWARE

Session GF
MAGNETIC FLUIDS, COMPOSITES AND BIOMEDICAL DEVICES

Jürgen Kosel, Chair
King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

8:30

GF-01. **Magneto-elastic composite membranes for wireless flow systems.** ***(Invited)*** *M.T. Bryan*[1], E.L. Martin[1], P.D. Inzani[1], J.K. Hamilton[1] and F.Y. Ogrin[1] *1. College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, United Kingdom*

9:06

GF-02. **Chip-based magnetorelaxometry of nanomagnetic beads based on high-resolution elliptical planar Hall effect sensors.** *P.T. Das*[1], M. Sasonker[1], M. Schultz[1], V. Mor[1] and L. Klein[1] *1. Department of Physics, Bar-Ilan University, Ramat Gan, Israel*

9:18

GF-03. **Withdrawn**

9:30

GF-04. **Magnetic isolation of exosomes using Fe/Au nanowires: towards an improved early detection of cancer.** *Z. Nemati Porshokouh*[1,2], T. Gage[1], M. Zamani Kouhpanji[1], D. Shore[1], J. Um[1], K. Makielski[2,3], R. Franklin[1], J. Modiano[2,3] and B. Stadler[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Animal Cancer Care and Research Program, University of Minnesota, St Paul, MN, United States; 3. Department of Veterinary Clinical Sciences, University of Minnesota, St Paul, MN, United States*

9:42

GF-05. **Microstructure engineering of magnetically hard and soft composite polymer for controlled trapping in Lab-On-Chip systems.** *S. Mekkaoui*[1], A. Deman[1], M. Audry[1], E. Laurenceau[1], J. Garcia[2], L. Payen[2] and D. Le Roy[3] *1. Institut des Nanotechnologies de Lyon, Lyon, France; 2. Hospices Civils de Lyon, Lyon, France; 3. Institut Lumière Matière, Lyon, France*

9:54

GF-06. **Nanowire substrate to control differentiation of mesenchymal stem cells.** *A. Sharip*[1], J.E. Perez[1], N. Alsharif[1], E. Fabrizio[2], J. Merzaban[1] and J. Kosel[3] *1. Biological and Environmental Science and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 2. Physical Science and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 3. Computer, Electrical and Mathematical Science and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

10:06

GF-07. **Low frequency induction heating of 3D printed ferromagnetic composites: toward medical applications.** *Z. Xiang*[1], M. Le[1], P. Cottinet[1] and B. Ducharne[1] *1. LGEF, INSA Lyon, Villeurbanne, France*

10:18

GF-08. **Ultrasensitive Magnetometry for NanoChemistry & Bio-Physics Devices.** *F. Terki*[1], Q. Tran[1], M. Mahfoud[1,2], S. Kamara[3], E. Belarbi[2], A. Boukra[4], C. Kim[5] and A. Bousseksou[6] *1. Université de Montpellier, CNRS UMR5253, Montpellier, France; 2. Université Ibn Khaldoun, Tiaret, Algeria; 3. Institut de Physique Nucléaire d'Orsay CNRS/IN2P3, Université Paris Sud, Orsay, France; 4. Université Ibn Badis, Mostaganem, Algeria; 5. Daegu Gyeongbuk Institute of Science and Technology (DGIST), Daegu, The Republic of Korea; 6. Laboratoire de Chimie de Coordination CNRS UPR-8241, Toulouse, France*

10:30

GF-09. **Using magnetic-field gradients to shorten the antigen–antibody reaction time for a magnetic immunoassay.** *K. Tsukada*[1], K. Tsunashima[1], K. Jinno[1], S. Takeuchi[1], K. Fujimoto[1], K. Sakai[1], T. Kiwa[1] and M. Saari[2] *1. Okyama University, Okayama, Japan; 2. University Malaysia Pahang, Pahang, Malaysia*

10:42

GF-10. **Magnetic nanoparticle chain-assemblies in magnetotactic bacteria.** *M. Charilaou*[1,2] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Department of Physics, University of Louisiana at Lafayette, Lafayette, LA, United States*

10:54

GF-11. **Using Superparamagnetic Nanoclusters for Rapid Bioanalysis in Red Wine.** A. Moyano[1,5], M. Salvador[1,2], J.C. Martínez-García[1], V. Socoliuc[3], L. Vékás[3], D. Peddis[2], M. Fernández[4], M.C. Blanco[5] and *M. Rivas*[1] *1. Department of Physics, University of Oviedo, Gijon, Spain; 2. Institute of Structure of Matter, National Research Council, Rome, Italy; 3. Timisoara Branch, Center for Fundamental and Advanced Technical Research, Romanian Academy, Timisoara, Romania; 4. Institute of Dairy Products, National Research Council, Villaviciosa, Spain; 5. Department of Analytical and Physical Chemistry, University of Oviedo, Oviedo, Spain*

11:06

GF-12. **Magneto-mechanical vs. direct inductive power transfer for biomedical devices in the body.** *Y. Malkova*[1] and G. Friedman[1] *1. Electrical Engineering, Drexel University, Philadelphia, PA, United States*

11:18

GF-13. **Capturing Magnetic Bead-based Arrays Using Perpendicular Magnetic Anisotropy (PMA).** *Y. Hsiao*[1], R.I. Khojah[3], L. Xu[2], A. Kundu[1], C. Chen[1], A.C. Chavez[1], Z. Xiao[4], A. Sepulveda[1], R. Candler[4], G. Carman[1], D. Carlo[3] and C. Lynch[1] *1. Mechanical and Aerospace Engineering, UCLA, Los Angeles, CA, United States; 2. Intel Corporation, Portland, OR, United States; 3. Bioengineering Department, UCLA, Los Angeles, CA, United States; 4. Electrical Engineering, UCLA, Los Angeles, CA, United States*

FRIDAY
MORNING
8:30

WASHINGTON 1

Session GG
MAGNETIC IMAGING AND MEASUREMENT TECHNIQUES II
Sean Langridge, Chair
Rutherford Appleton Laboratory, Chilton, United Kingdom

8:30

GG-01. **Systematic Determination of Magnetic Structure Driven by Space Groups, as Implemented in GSAS-II.** ***(Invited)*** *R.B. Von Dreele*[1] *1. APS, Argonne National Laboratory, Lemont, IL, United States*

9:06

GG-02. **Chirality in ferromagnetic and antiferromagnetic multilayers probed by dichroism in x-ray resonant magnetic scattering.** J. Chauleau[1,2], W. Legrand[2], *E.O. Burgos Parra*[1,2], N. Reyren[2], D. Maccariello[2], S. Collin[2], H. Popescu[1], K. Bouzehouane[2], N. Jaouen[1], V. Cros[2] and A. Fert[2] *1. Ex Division, Synchrotron SOLEIL, Gif sur Yvette, France; 2. Unité Mixte de Physique CNRS/Thales, Palaiseau, France*

9:18

GG-03. **Room temperature magnetic moment profile of EuS in EuS/Co/Ni multilayers measured by XRMS.** *A. Goschew*[1], A. Stamatelatos[2], P. Poulopoulos[2], F. Wilhelm[3], A. Rogalev[3] and P. Fumagalli[1] *1. Experimental Physics, Free University Berlin, Berlin, Germany; 2. Materials Science Department, University of Patras, Patras, Greece; 3. ESRF, Grenoble, France*

9:30

GG-04. **Magnetic correlations in martensitic Heusler alloys under hydrostatic pressure : Neutron scattering.** *S. Aksoy Esinoglu*[1], A. Wildes[2] and M. Acet[3] *1. Istanbul Technical University, Istanbul, Turkey; 2. Institut Laue Langevin, Grenoble, France; 3. Duisburg-Essen University, Duisburg, Germany*

9:42

GG-05. **Avoiding the Zero-Coercivity Anomaly in First Order Reversal Curves: FORC+.** *P.B. Visscher*[1] *1. MINT Center, University of Alabama, Tuscaloosa, AL, United States*

9:54

GG-06. **Interpreting FORC Diagrams Beyond the Preisach Model: an Experimental Permalloy Micro Array Investigation.** *F. Gross*[1], S.E. Ilse[1], G.A. Schütz[1], J. Gräfe[1] and E.J. Goering[1] *1. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

10:06

GG-07. **Swept-Frequency Eddy Current Testing to Characterize the Layer of Interest in a Multilayered Structure.** *W. Cheng*[1,2], N. Yusa[2] and H. Hashizume[2] *1. Japan Power Engineering and Inspection Corporation, Yokohama, Japan; 2. Quantum Science and Energy Engineering, Tohoku University, Sendai, Japan*

10:18

GG-08. **Characterization of Amorphous Magnetic Link Under High-Frequency Non-Sinusoidal Excitations.** *M. Rahman*[1], M. Islam[1], K.M. Muttaqi[1] and D. Sutanto[1] *1. Faculty of Engineering and Information Sciences, University of Wollongong, Wollongong, NSW, Australia*

10:30

GG-09. **Unified Test Equipment for Ultra-Fast Wafer Level Characterization of Integrated Magnetic Device Technologies.** *S. Salimy*[1], G. Zahnd[1], E. Montredon[1], N. Lamard[1], B. Blanc[1], I. Joumard[2], A. Chavant[2], R.C. Sousa[2], L. Lebrun[1] and J. Nozieres[1] *1. Hprobe, Eybens, France; 2. Spintec (UMR 8191) CNRS / CEA / UGA, Grenoble, France*

10:42

GG-10. **Numerical scheme for the simulation of the Eddy Current Magnetic Signature (ECMS) non-destructive micro-magnetic technique.** *T. Matsumoto*[1], B. Ducharne[2] and T. Uchimoto[3,4] *1. Graduate school of Engineering, Tohoku University, Sendai, Japan; 2. LGEF, INSA Lyon, Villeurbanne, France; 3. Université de Lyon, Tohoku University, International Joint Uni, ELyTMaX UMI 3757, Sendai, Japan; 4. Tohoku University, Institute of fluid science IFS, Sendai, Japan*

10:54

GG-11. **Dealing with magnetization effects in EV positioning systems based on periodic magnetic signals.** *D. Martinovic*[1] *1. Institute of Internal Combustion Engines and Automotive, University of Stuttgart, Stuttgart, Germany*

11:06

GG-12. **4D Full-Vector Radio Frequency Complex Magnetic Susceptibility Mapping. Near-field Imaging of RFID Tags.** *P.S. Stamenov*[1], K. Ackland[1], M. Lotya[2,1] and D.J. Finn[2,1] *1. School of Physics and CRANN, Trinity College, Dublin, Ireland; 2. AmaTech Corp Group Ltd., Galway, Ireland*

11:18

GG-13. **Local measurement of peening-induced residual stresses on Iron Nickel material using needle probes technique.** *Y.A. Tene Deffo*[1], B. Gupta[3,4], B. Ducharne[3], P. Tsafack[1] and L. Morel[2] *1. Faculty of Engineering, Buea University, Buea, Cameroon; 2. Ampère Laboratory, Claude Bernard University, Villeurbanne, France; 3. LGEF, INSA LYON, Villeurbanne, France; 4. ELYTMAX, Tohoku University, Sendai, Japan*

FRIDAY MORNING 8:30 — WASHINGTON 2

Session GH

MULTI-LAYERED FILMS AND SUPERLATTICES II

Karin Leistner, Chair
IFW Dresden, Dresden, Germany

8:30

GH-01. **Radial Magnetic Vortices and Skyrmions in Patterned Multilayers with Tailored Anisotropies.** ***(Invited)*** *O. Ozatay*[1], V. Karakas[1], A. Gokce[1], A. Habiboglu[1], S. Arpaci[1], K. Ozbozduman[1], I. Cinar[1], C. Yanik[2], R. Tomasello[3], S. Tacchi[4], G. Siracusano[5], M. Carpentieri[6], G. Finocchio[5] and T. Hauet[7] *1. Physics, Bogazici University, Istanbul, Turkey; 2. Nanotechnology Research and Application Center, Sabanci University, Istanbul, Turkey; 3. Department of Engineering, Polo Scientifico Didattico di Terni, University of Perugia, Terni, Italy; 4. Istituto Officina dei Materiali del CNR (CNR-IOM), Sede Secondaria di Perugia, c/o Dipartimento di Fisica e Geologia, Università di Perugia, Perugia, Italy; 5. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 6. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy; 7. Institut Jean Lamour, Université de Lorraine, Vandoeuvrelès Nancy, France*

9:06

GH-02. **Stabilizing Extended Target Skyrmions in DMI Multilayers via Structural Imprinting.** *N. Kent*[1,2], R. Streubel[2], C.A. Lambert[3], F. Buettner[4], S. Dhuey[2], M. Im[2] and P. Fischer[2] *1. Physics, University of California, Santa Cruz, Santa Cruz, CA, United States; 2. Material Science Division, Lawrence Berkeley National Lab, Berkeley, CA, United States; 3. Department of Electrical Engineering and Computer Science, University of California, Berkeley, Berkeley, CA, United States; 4. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

9:18

GH-03. **Angular Dependence of Thickness-Gradient-Induced Unidirectional Anisotropic Magnetoresistance in Co/Pt Multilayer.** *J. Oh*[1], L. Humbard[1], V. Humbert[1], J. Sklenar[1] and N. Mason[1] *1. Physics, University of Illinois, Urbana-Champaign, Urbana, IL, United States*

9:30

GH-04. **Static and Dynamic Properties of Modulated Phases in Co/Pt Multilayers and their Dependence on the Total Magnetic Thickness.** *L. Fallarino*[1], A. Oelschlägel[1], J. Arregi[2], S. Stienen[1], J. Lindner[1], R. Gallardo[5], P. Landeros[5], T. Schneider[1], K. Chesnel[3], K. Lenz[1] and O. Hellwig[1,4] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. CEITEC BUT, Brno University of Technology, Brno, Czechia; 3. BYU, Provo, UT, United States; 4. Institute of Physics, Chemnitz University of Technology, Chemnitz, Germany; 5. Universidad Técnica Federico Santa María, Valparaíso, Chile*

9:42

GH-05. **Understand the ordering of hexagonal Co_3Pt.** *X. Lu*[1], D. Laughlin[1] and J. Zhu[1] *1. Carnegie Mellon University, Pittsburgh, PA, United States*

9:54

GH-06. **Tunable Anisotropy and Coercivity in Amorphous Tb-Co/Sm-Co Bilayer Films.** *S. George*[1], V. Djurberg[2], F. Magnus[3], B. Skovdal[1] and G. Andersson[1] *1. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; 2. Department of Engineering Sciences, Uppsala University, Uppsala, Sweden; 3. Science Institute, University of Iceland, Reykjavik, Iceland*

10:06

GH-07. **Temperature dependent investigation of stripe morphology and DMI determination from stripe width measurements.** *N. Kerber*[1,2], K. Litzius[1,2], J. Zazvorka[1], N. Keil[1], J. Nothhelfer[1], M. Asa[1], P. Bassirian[1], I. Lemesh[3], M. Weigand[4], S. Finizio[5], J. Raabe[5], G. Beach[3] and M. Kläui[1,2] *1. Institute of Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 3. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. Swiss Light Source, Paul Scherrer Institut, Villigen, Switzerland*

10:18

GH-08. Engineering Interfacial Perpendicular Magnetic Anisotropy in Fe_2CoSi/Pt heterostructure with Interface Strain and Orbital Hybridization. *Y. Liu*[1], A.P. Chen[2], L. Ren[1], Y. Liu[1], S. Srivastava[1], Y. Feng[2], H. Yang[1] and K.L. Teo[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 2. Department of Physics, National University of Singapore, Singapore*

10:30

GH-09. High Thermal Stability in W/Zr/CoFeB/MgO Stack with Perpendicular Magnetic Anisotropy studied by Polarized Neutron Reflectometry. F. Chang[1,3], *T. Zhu*[1], H. Ambaye[2] and V. Lauter[2] *1. Institute of Physics, CAS, Beijing, China; 2. Neutron Science Directorate, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 3. Institute of High Energy Physics, CAS, Beijing, China*

10:42

GH-10. Permalloy Thickness Effect on Magnetic Properties of Magnetostrictive Galfenol. *M.E. Jamer*[1,2], C.R. Rementer[3], A. Barra[4], K. Fitzell[3], G. Carman[4], A.J. Grutter[2], D.A. Gilbert[2], D.B. Gopman[5], B. Kirby[2], J. Borchers[2] and J.P. Chang[3] *1. Physics, United States Naval Academy, Annapolis, MD, United States; 2. NIST Center for Neutron Research, NIST, Gaithersburg, MD, United States; 3. Chemical and Biomolecular Engineering, University of California Los Angeles, Los Angeles, CA, United States; 4. Mechanical and Aerospace Engineering, University of California Los Angeles, Los Angeles, CA, United States; 5. Materials Science and Engineering Division, NIST, Gaithersburg, MD, United States*

10:54

GH-11. Bubble Domains at the Crossover of the In-plane Transition for the Fe/Co Bilayer. Y. Chan[1], C. Huang[1,2], T. Chuang[2], D. Wei[2] and *C. Kuo*[1] *1. Department of Physics, National Sun Yat-sen University, Kaohsiung, Taiwan; 2. National Synchrotron Radiation Research Center, Hsinchu, Taiwan*

11:06

GH-12. Resonant tunneling anisotropic magnetoresistance in an Fe spin-dependent quantum well. M. Al-Mahdawi[1], Q. Xiang[1], M. Belmoubarik[1], H. Sukegawa[1], S. Kasai[1], K. Masuda[1], Y. Miura[1] and *S. Mitani*[1] *1. National Institute for Materials Science, Tsukuba, Japan*

11:18

GH-13. Enhanced Permeability Dielectric Films with Tailored Properties Deposited by Magnetron Sputtering on Silicon. *C. Falub*[1], O. Yildirim[2], X. Zhao[1,2], H.J. Hug[2], M. Meduna[3,4], O. Caha[3,4], R. Hida[5], J. Michel[5], J. Zweck[6], J. Ambrosini[1], H. Rohrmann[1] and S.V. Pietambaram[7] *1. Evatec AG, Trübbach, Switzerland; 2. Nanoscale Materials Science, Empa, Dubendorf, Switzerland; 3. Department of Condensed Matter Physics, Masaryk University, Brno, Czechia; 4. CEITEC, Masaryk University, Brno, Czechia; 5. Univ. Grenoble Alpes, CEA, LETI, Grenoble, France; 6. Institut für Experimentelle und Angewandte Physik, University of Regensburg, Regensburg, Germany; 7. Substrate Packaging Tech. Development, Intel Corporation, Chandler, AZ, United States*

Session GI
HARD MAGNETIC MATERIALS THEORY AND APPLICATION II

Scott McCall, Chair
Lawrence Livermore National Laboratory, Livermore, CA, United States

8:30

GI-01. **Spin reorientation, magnetostriction, symmetry change in MnBi: new insights from X-ray probes.** ***(Invited)*** *Y. Choi*[1], P. Ryan[1], M. McGuire[2], B.C. Sales[2] and J. Kim[1] *1. Argonne National Laboratory, Argonne, IL, United States; 2. Oak Ridge National Laboratory, Oak Ridge, TN, United States*

9:06

GI-02. **Inelastic neutron scattering study for rare earth magnets $R_2Fe_{14}B$ and $RFe_{11}Ti$ (R = Y, Nd).** *H. Takafumi*[1], M. Yano[2], T. Shoji[2], H. Saito[1], T. Yokoo[1], S. Itoh[1] and K. Ono[1] *1. Institute of Materials Structure Science, High Energy Accelerator Research Organization, Tsukuba, Japan; 2. Advanced Materials Engineering Div., Toyota Motor Corporation, Susono, Japan*

9:18

GI-03. **Crystal-field analysis of the full magnetization process of the $TmFe_{11}Ti$ and $TmFe_{11}TiH$ rare-earth intermetallics.** *N. Kostyuchenko*[1], I. Tereshina[2], E. Tereshina-Chitrova[3], Y. Skourski[4], M. Doerr[5], A.K. Zvezdin[1,6], M. Paukov[7,8], L. Havela[7] and H. Drulis[9] *1. Moscow Institute of Physics and Technology (State University), Moscow, Russian Federation; 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russian Federation; 3. Institute of Physics CAS, Prague, Czechia; 4. Hochfeld-Magnetlabor Dresden (HLD-EMFL), Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 5. Institut für Festkörper- und Materialphysik, Technische Universität Dresden, Dresden, Germany; 6. A. M. Prokhorov General Physics Institute RAS, Moscow, Russian Federation; 7. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 8. Laboratory of Novel Magnetic Material, Immanuel Kant Baltic Federal University, science and technology park "Fabrica", Kaliningrad, Russian Federation; 9. Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Wroclaw, Poland*

9:30

GI-04. **Theoretical Description of the Finite Temperature Magnetic Properties of $R(Fe_xM_{1-x})_{12}$ Systems.** *T. Yoshioka*[1,2] and H. Tsuchiura[1,2] *1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. Elements Strategy Initiative Center for Magnetic Materials (ESICMM), National Institute for Materials Science, Tsukuba, Japan*

9:42

GI-05. **Temperature dependence of element-specific spin- and orbital-moments in $Sm(Fe_{1-x}Co_x)_{12}$ system.** *K. Toyoki*[1,2], N. Sasabe[1], D. Billington[1,2], H. Okazaki[1,2], Y. Kotani[1], D. Ogawa[2], Y. Takahashi[2], K. Hono[2], S. Hirosawa[2] and T. Nakamura[1,2] *1. Research & Utilization Division, Japan Synchrotron Radiation Research Institute (JASRI), Sayo, Japan; 2. National Institute for Materials Science, Tsukuba, Japan*

9:54

GI-06. **Effect of Anisotropic Exchange Stiffness on the Coercivity in Rare-Earth Permanent Magnet.** *Y. Toga*[1], M. Nishino[2,1], S. Miyashita[3,1], T. Miyake[4,1] and A. Sakuma[5] *1. ESICMM, NIMS, Tsukuba, Japan; 2. Research Center for Advanced Measurement and Characterization, NIMS, Tsukuba, Japan; 3. Department of Physics, The University of Tokyo, Tokyo, Japan; 4. CD-FMat, AIST, Tsukuba, Japan; 5. Department of Applied Physics, Tohoku University, Sendai, Japan*

10:06

GI-07. **Curie temperature of Sm_2Fe_{17} and $Nd_2Fe_{14}B$: a first-principles study.** *T. Fukazawa*[1,2], H. Akai[3,2], Y. Harashima[1,2] and T. Miyake[1,2] *1. CD-FMat, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; 2. ESICMM, National Institute for Materials Science, Tsukuba, Japan; 3. The Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan*

10:18

GI-08. **First-order magnetization process and spin reorientation in $Nd_{1-x}Y_xFe_{11}Ti$ compounds.** *O. Tosun*[1] and G. Hadjipanayis[1] *1. Physics & Astronomy, University of Delaware, Newark, DE, United States*

10:30

GI-09. **Investigation of coercivity mechanism of NdFeB based magnet within combination of First Order Reversal Curve diagram and and Small Angle Neutron Scattering.** *T. Shoji*[4], M. Yano[2], K. Saito[1] and K. Ono[3] *1. Laboratory of Neutron Scattering and Imaging, Paul Scherrer Institute, Villigen, Switzerland; 2. Material Platform Engineering Division, Toyota Motor Corporation, Toyota, Japan; 3. Materials Structure Science, High Energy Accelerator Research Organization, Tsukuba, Japan; 4. Advanced Material Engineering Division, Toyota Motor Corporation, Susono, Japan*

10:42

GI-10. **Quantifying micromagnetic interactions in NdFeB by using FORC.** *S.E. Ilse*[1], F. Gross[1], G.A. Schütz[1], J. Gräfe[1] and E.J. Goering[1] *1. Modern Magnetic Systems (Schütz), Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

10:54

GI-11. **Prediction of Intrinsic Properties of Fe-doped $CeCo_5$.** *R. Choudhary*[1] and D. Paudyal[1] *1. Ames Laboratory, U.S. Department of Energy, Iowa State University, Ames, IA, United States*

11:06

GI-12. **Structural Modifications of Nd-Fe-B Magnets during a Sub- and Supercritical Recycling Process.** *V. Nachbaur*[1], N. Maât[2], M. Kchaw[1], S. Jouen[1], C. Aymonier[3] and J. Le Breton[1] *1. Normandie Univ, UNIROUEN, INSA Rouen, CNRS, Groupe de Physique des Materiaux, Rouen, France; 2. Department of Chemical Engineering, Northeastern University, Boston, MA, United States; 3. CNRS, Bordeaux INP, ICMCB, UMR5026, Univ. Bordeaux, Bordeaux, France*

11:18

GI-13. **Efficient Reuse Approaches for Recycling of Rare Earth Permanent Magnets.** *K. Gandha*[1], H.A. Khazdozian[1], M.P. Paranthaman[2] and C.I. Nlebedim[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States; 2. Oak Ridge National Laboratory, Oak Ridge, TN, United States*

FRIDAY MORNING 9:30 — EXHIBIT HALL A

Session GJ
MAGNETIC FIELD SENSORS AND APPLICATIONS (Poster Session)

Ivan Lisenkov, Chair
Winchester Technologies, LLC, Burlington, MA, United States

GJ-01. **Arc-Faults Detection in DC Systems by TMR Sensors.** *W.C. Miao*[1], X. Liu[1], K. Lam[1] and P. Pong[1] *1. University of Hong Kong, Hong Kong*

GJ-02. **Development of a Misalignment-Tolerant Wireless Charging Technique via TMR Sensor Array for Roadway Electric Vehicles.** *X. Liu*[1], C. Liu[2] and P. Pong[1] *1. Department of Electrical and Electronic Engineering, University of Hong Kong, Hong Kong, Hong Kong; 2. School of Energy and Environment, City University of Hong Kong, Hong Kong*

GJ-03. **Surface texturing and enhanced microwave absorption of FeB alloy flakes through a dealloying process.** *N. Tian*[1], W. Song[1], Z. Yang[1], H. Fu[1], L. Ma[1], C. You[1] and W. Wang[1] *1. Xi'an University of Technology, Xi'an, China*

GJ-04. **Enhanced output power from energy-harvesting device using a Wiegand wire with flux guidance.** *T. Sakai*[1], T. Yamada[1] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

GJ-05. **TMR-Sensor-Based Approach for Current Reconstruction, Sag Detection and Inclination Detection for Overhead Transmission System.** *Q. Xu*[1], X. Liu[1], C. Liu[2] and P. Pong[1] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong, Hong Kong; 2. School of Energy and Environment, City University of Hong Kong, Hong Kong*

GJ-06. Rotation-Type Magnetic Flux Leakage Sensor System for Large Pipeline Inspection. *C. Heo*[1] and G. Park[1] *1. Department of Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea*

GJ-07. A flexible zero-biased magnetoelectric sensor based on FeSiB nanocrystalline alloy for AC magnet field detection. Y. Long[1], *J. Qiu*[1], X. He[1], Q. Chang[1], H. Liu[1], X. Tang[1], W. Hu[1], Y. She[1] and X. Wang[2] *1. College of Optoelectronic Engineering, Chongqing University, Chongqing, China; 2. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*

GJ-08. An integrated magnetic field and vibration energy harvester for intelligent wireless sensor systems. Q. Chang[1], *J. Qiu*[1], Y. Long[1], X. He[1], H. Liu[1], X. Tang[1], W. Hu[1], Y. She[1] and X. Wang[2] *1. College of Optoelectronic Engineering, Chongqing University, ChongQing, China; 2. School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan, China*

GJ-09. Hall effect of amorphous CoSiB multilayer films for hall sensors. *H. Lee*[1] and Y. Kim[1] *1. Sejong University, Seoul, The Republic of Korea*

GJ-10. Experimental results of verification of the unbalanced magnetic power for brushless DC motors due to current sensor sensitivity. *C. Hsu*[1] and M. Hsieh[2] *1. Department of Mechanical Engineering, Oriental Institute of Technology, New Taipei, Taiwan; 2. Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan*

GJ-11. Microwave absorbing properties of Zn^{2+}-Ti^{4+} substituted U-type hexaferrite. D.P. Dubey[1], S. Kumar[1] and *R. Chatterjee*[1] *1. Physics, IIT Delhi, New Delhi, India*

FRIDAY
MORNING
9:30

EXHIBIT HALL A

Session GK

EXCHANGE BIAS AND NANOMAGNETISM (Poster Session)

Thomas Ambrose, Chair
Northrop Grumman Corporation, Linthicum, MD, United States

GK-01. Remanent Magnetization dependent Exchange Bias in Hard/Soft Ferromagnetic Bilayer system. V. Bhardwaj[1], M.S. Anwar[1], S.P. Pal[1] and *R. Chatterjee*[1] *1. Physics, IIT Delhi, New Delhi, India*

GK-02. **Exchange bias in Co/MnPt polycrystalline films on SiO_2/Si(100) substrates.** H.W. Chang[1], P. Pan[2], *P. Yeh*[3], C. Shen[4], W. Chang-Ren[3] and L. Horng[5] *1. Physics, National Chung Cheng University, Chia-Yi, Taiwan; 2. Physics, National Tsinghua University, Hsinchu, Taiwan; 3. Applied Physics, Tunghai University, Taichung, Taiwan; 4. Electrical Engineering, Hsiuping University of Science and Technology, Taichung, Taiwan; 5. Physics, National Changhua University of Education, Changhua, Taiwan*

GK-03. **High Annealing Temperature Tolerance Improvement in Longitudinal Magnetic Tunnel Junction with Synthetic Antiferromagnetic Pinned Layer.** *S. Oikawa*[1], H. Yoda[1], Y. Kato[1], N. Shimomura[1], Y. Ohsawa[1], S. Shirotori[1], M. Shimizu[1], K. Koi[1], T. Inokuchi[1], H. Sugiyama[1], B. Altansargai[1] and A. Kurobe[1] *1. Corporate R&D Center, Toshiba Corporation, Kawasaki, Japan*

GK-04. **Spin glass-like ground state and observation of giant exchange bias in Mn-rich Mn-Ni-Sn Heusler alloys.** *J. Sharma*[1], A.K. Patel[2] and K. Suresh[2] *1. Dept. of Condensed Matter Physics & Materials Science, Tata Institute of Fundamental Research, Mumbai, Mumbai, India; 2. Physics, Indian Institute of Technology Bombay, Mumbai, India, Mumbai, India*

GK-05. **Magnetic Phase Change Studied in Current Perpendicular-to-Plane FeRh Devices.** R.C. Temple[1], *J. Massey*[1], T.P. Almeida[2], M.C. Rosamond[3], K. Fallon[2], D. McGrouther[2], T.A. Moore[1], S. McVitie[2] and C.H. Marrows[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 3. School of Electronic and Electrical Engineering, University of Leeds, Leeds, United Kingdom*

GK-06. **Unique Magnetic Properties of 3D Antidots Created by Nanosphere Lithography.** *B. Myint*[1] and V. Ng[1] *1. Information Storage Materials Laboratory, Electrical and Computer Engineering Department, National University of Singapore, Singapore, Singapore*

GK-07. **XPEEM Imaging of Uncommon Magnetization Reversal in Artificial Ferromagnetic Quasicrystals with Varied Exchange and Dipolar Interactions.** *V.S. Bhat*[1], S. Watanabe[1], K. Baumgärtl[1], F. Kronast[2] and D. Grundler[1] *1. Institute of Materials and Laboratory of Nanoscale Magnetic Materials and Magnonics, École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; 2. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Albert-Einstein-Strasse 15, D-12489 Berlin, Germany*

GK-08. **Evaluation of magnetic properties of $CoFe_2O_4$ ultrathin film using magnetic proximity effect.** *S. Nodo*[1], T. Yamamoto[1], T. Yanase[2], T. Shimada[2] and T. Nagahama[2] *1. Graduate School of Chemical Sciences and Engineering, Hokkaido University, Sapporo, Japan; 2. Graduate School of Engineering, Hokkaido University, Sapporo, Japan*

Session GL
SOFT MAGNETIC COMPONENTS: OTHER APPLICATIONS (Poster Session)

Tsuyoshi Uchiyama, Chair
Nagoya University, Nagoya, Japan

GL-01. Study on Directivity Dual Capsule Structure Element for Magnetic Soft Heating Hyperthermia System. *Y. Yokoshita*[1], S. Oba[1], Y. Hongo[1], T. Abe[1], S. Miyahara[1], F. Sato[1] and K. Ishikawa[1] *1. Tohoku Gakuin Unversity, Tagajo, Japan*

GL-02. Inductance Calculation of Spiral Coil Considering Ferrite Core Hole for Design of Induction Heater. *Y. Jang*[1] and G. Park[2] *1. Department of Smart Interdisciplinary Engineering, Pusan National University, Busan, The Republic of Korea; 2. Department of Electrical Engineering, Pusan National University, Busan, The Republic of Korea*

GL-03. A Fundamental Study on Smoothing of Magnetic Excitation of Implant Stimulator in Direct Feeding FES. *Y. Kato*[1], Y. Hongo[1], T. Abe[1], S. Oba[1], F. Sato[1], S. Miyahara[1] and K. Ishikawa[1] *1. Tohoku Gakuin University, Tagajo, Japan*

GL-04. Magneto-thermal coupling design and current limiting characteristics experimental investigation of a 10 kV hybrid superconducting fault current limiter (SFCL) with bias magnetic field. *J. Zhu*[1] *1. China Electric Power Research Institute, Beijing, China*

GL-05. Design for Efficiency Improvement of an Induction Range by Reducing Eddy Current of Shielding Plate. *S. Im*[1], J. Kim[2] and G. Park[1] *1. Electrical and Computer Engineering, Pusan National University, Busan, The Republic of Korea; 2. Korea Aerospace Industries, Sacheon, The Republic of Korea*

GL-06. DC Circuit Breaker Based on Saturated Core Current-limiter. J. Yuan[1], *Z. Zhang*[1], P. Gan[1], H. Zhou[1], L. Wei[1], C. Tian[1], B. Chen[1], Y. Gao[2] and K. Muramatsu[2] *1. Wuhan University, Wuhan, China; 2. Saga University, Saga, Japan*

GL-07. Quasi-3D Cylindrical Coordinate XFEM Model of HTS Cable. *N. Duan*[1], W. Xu[2], S. Wang[1] and J. Zhu[3] *1. Xi'an Jiaotong University, Xi'an, China; 2. State Grid Shaanxi Electric Power Company Construction Branch, Xi'an, China; 3. The University of Sydney, Sydney, NSW, Australia*

GL-08. A Saturated Amorphous Magnetic Core based Inrush Current Limiter. *M.M. Islam*[1], M. Islam[1], K.M. Muttaqi[1] and D. Sutanto[1] *1. School of Electrical, Computer and Telecommunication Engineering, University of Wollongong, Wollongong, NSW, Australia*

GL-09. **Design considerations for monophasic and biphasic pulsed field generators for portable single-sided NMR applications.** N. Prabhu Gaunkar[1], T. Kimler[1], *W. Theh*[1], D.C. Jiles[1], R. Weber[1] and M. Mina[1,2] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Industrial Design, Iowa State University, Ames, IA, United States*

GL-10. **Observations of Anomalous Localized Magnetization in Bismuth-Substituted Iron Garnet.** L. Bauer[1,2], *N. Prabhu Gaunkar*[1] and M. Mina[1,3] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States; 2. Electrical and Computer Engineering, Purdue University, West Lafayette, IN, United States; 3. Industrial Design, Iowa State University, Ames, IA, United States*

FRIDAY MORNING 9:30 — EXHIBIT HALL A

Session GM
MAGNETO-ELASTIC MATERIALS (Poster Session)

Nicholas Jones, Chair
Naval Surface Warfare Center, Carderock Division, Bethesda, MD, United States

GM-01. **A Hybrid Jiles-Atherton/Armstrong Magnetization Model Considering Uniaxial Anisotropy for Galfenol Rods.** *Y. Li*[1], B. Wang[1], W. Huang[1] and L. Weng[1] *1. Hebei University of Technology, Tianjin, China*

GM-02. **Guided Wave Phased Array Sensor based on a Galfenol Flake-Epoxy Composite Patch with a Circular Comb Pattern.** *B. Yoo*[1] and D.J. Pines[1] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States*

GM-03. **Strain-induced Elastocaloric Effect in $Ti_{51}Ni_{49}$ Shape Memory Alloy.** *X. Luo*[1,2], J. Qi[1,3], W. Ren[1], W. Jin[4], Y. Zhuang[3], S. Ma[2], Z. Zhong[2] and Z. Zhang[1] *1. Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China; 2. Jiangxi Key Laboratory for Rare Earth Magnetic Materials and Devices/ Institute for Rare Earth Magnetic Materials and Devices, Jiangxi University of Science and Technology, Ganzhou, China; 3. Key Laboratory of Electromagnetic Processing of Materials, Northeastern University, Shenyang, China; 4. Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China*

GM-04. **The microstructure and ultrasonic guided wave sensing performance of magnetostrictive Fe-Ga coatings.** Q. Qi[1], J. Li[1], *Z. Tang*[2] and X. Gao[1] *1. State Key Laboratory for Advanced Metals and Materials, University of Science and Technology Beijing, Beijing, China; 2. Institute of Advanced Digital Technologies and Instrumentation, Yuquan campus, Zhejiang University, Hangzhou, China*

GM-05. **Modelling the Magnetoelastic Properties of Composites of Aligned Rigid Magnetic Spheroidal Inclusions in a Linear Elastic Matrix.** *J.P. Rath*[1] and S. Lofland[1] *1. Physics and Astronomy, Rowan University, Glassboro, NJ, United States*

GM-06. **Effect of Ga Composition on Statics and Dynamic Magnetic Properties of Polycrystalline $Fe_{100-x}Ga_x$ Films.** *Y. Endo*[1,2], Y. Kawabe[1], T. Miyazaki[3] and Y. Shimada[1] *1. ECEI, Tohoku University, Sendai, Japan; 2. CSRN, Tohoku University, Sendai, Japan; 3. Technical Division, Tohoku University, Sendai, Japan*

GM-07. **Hybrid magneto-dynamical modes in a single magnetostrictive nanomagnet on a piezoelectric substrate.** S. Mondal[1], M. Abeed[2], K. Dutta[1], A. De[1], S. Sahoo[1], *A.K. Chaurasiya*[1], A. Barman[1] and S. Bandyopadhyay[2] *1. Condensed Mater Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata, India; 2. Department of Electrical and Computer Engineering, Virginia Commonwealth University, Richmond, VA, United States*

GM-08. **Production of a Flexible TPU-based Magnetorheological Elastomer for Fused Deposition Modeling.** *A. Becnel*[1] and C.M. Bailey[1] *1. Aerospace, University of Maryland, College Park, MD, United States*

GM-09. **Active Galfenol Bending Sensor for Monitoring Bending Load Impedances.** E.J. Barranco[1], *J. Park*[2], J. Yoo[3] and A.B. Flatau[1] *1. Aerospace Engineering, University of Maryland, Parkton, MD, United States; 2. Materials Science, University of Maryland, College Park, MD, United States; 3. Physical Metallurgy and Fire Protection Branch, Naval Surface Warfare Center, Carderock, MD, United States*

GM-10. **Alfenol Patch-, Galfenol Patch- and Galfenol Paint-Based Torque Sensor Characterization Studies.** B. Muller[1], M. Darok[1], M.N. Van Order[2], S. Na[1] and *A.B. Flatau*[1,2] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States; 2. Materials Science and Engineering, University of Maryland, College Park, MD, United States*

FRIDAY MORNING 9:30 — EXHIBIT HALL A

Session GN
DOMAIN WALL DYNAMICS AND DEVICES (Poster Session)

Vivek Amin, Co-Chair
NIST, Gaithersburg, MD, United States
Jamileh Beik Mohammadi, Co-Chair
New York University, New York, NY, United States

GN-01. **Influence of Heat Accumulation in Surface Oxidized Silicon Layer for Current-driven Domain Wall Motion in [Co/Tb] Magnetic Nanowires.** *Y. Miyamoto*[1], M. Okuda[1], M. Kawana[1] and N. Ishii[1] *1. Science & Technology Research Labs., NHK (Japan Broadcasting Corp.), Tokyo, Japan*

GN-02. **A Current Induced Domain Wall Motion Type Light Modulation Device for Electro-Holography.** *R. Higashida*[1], N. Funabashi[1], K. Aoshima[1] and K. Machida[1] *1. Science & Technology Research Laboratories, NHK (Japan Broadcasting Corporation), Setagaya-ku, Japan*

GN-03. **Current driven domain wall dynamics along curved paths: the role of geometry and inhomogeneous currents.** P.E. Guillem[1], L. Sánchez-Tejerina[1,2], E. Martinez[2], V. Raposo[2] and *O. Alejos*[1] *1. Electricidad y Electrónica, Universidad de Valladolid, Valladolid, Spain; 2. Física Aplicada, Universidad de Salamanca, Salamanca, Spain*

GN-04. **Domain Wall Pinning in Square Wave Shaped Magnetic Nanowires.** *D. Kumar*[1] and S. Piramanayagam[1] *1. Division of Physics and Applied Physics, Nanyang Technological University, Singapore, Singapore*

GN-05. **Observation of thermal distribution of magnetic nanowire memory by current injection.** *T. Sawa*[1], M. Kawamoto[1], S. Sumi[1], P. Van Thach[1], K. Tanabe[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

GN-06. **Magnetic energy of field driven domain wall intrinsic pinning in permalloy nano-wire devices with notch.** *D. Shiu*[1], C. Su[1], Y. Hong[1], K. Lai[1], L. Lin[1], Y. Kao[1], Y. Liu[1], J. Wu[1] and L. Horng[1] *1. Physics, National Changhua University of Education, Changhua, Taiwan*

GN-07. **Improved magnetic domain nucleation with antiferromagnetic coupling and voltage control magnetic anisotropy effect.** Z. Zhang[1], *Y. Zhang*[1], J. Nan[1], Z. Zheng[1], G. Wang[1], J. Klein[2], D. Ravelosona[2], Y. Zhang[1] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Univ. Paris-Saclay, Orsay, France*

GN-08. **Visualization of domain wall motion during ultrafast demagnetization of permalloy.** *G. Cao*[1], S. Jiang[1], J. Åkerman[1,2] and J. Weissenrieder[1] *1. Department of Applied Physics, KTH Royal Institute of Technology, Stockholm, Sweden; 2. Physics Department, University of Gothenburg, Gothenburg, Sweden*

GN-09. **Withdrawn**

GN-10. **Fast current-induced domain wall motion in symmetric ferrimagnetic Tb-Co alloy wires.** *P. Van Thach*[1,2], B. Do[2], S. Sumi[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan; 2. Institute of Materials Science, Vietnam Academy of Science and Technology, Ha noi, Vietnam*

Session GO
MOTORS: MODELING AND SIMULATIONS IX (Poster Session)

Marco Trapanese, Chair
Palermo University, Palermo, Italy

GO-01. **Comparative Study of Stator Consequent Pole Permanent Magnet Machines with Different Stator Configurations.** Y. Li[1], H. Yang[1], H. Lin[1], S. Lyu[1] and *Z. Pan*[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

GO-02. **High-Frequency Modeling for Wound-Rotor Synchronous Machine Based on VBR and Vector Fitting Methods.** *D. Zhao*[1,2], K. Shen[1,2], W. Liu[1,2], L. Lang[1,2] and P. Liang[1,2] *1. School of Automation, Northwestern Polytechnical University, Xi'an, China; 2. Shaanxi Key Laboratory of Small & Special Electrical Machine and Drive Technology, Xi'an, China*

GO-03. **A Study on the Shape Design of a Magnetic-Geared Synchronous Motor for Improvement of Performance and Securing Rigidity.** *G. Jeong*[1], I. Jo[2], C. Park[2], H. Lee[2], J. Lee[1] and H. Jang[1] *1. Hanyang University, Seoul, The Republic of Korea; 2. Korea National University of Transportation, Uiwamg-si, The Republic of Korea*

GO-04. **Improvement of FEA Accuracy of Magnetic Gear by Torsion Analysis of Pole Piece and Supporter.** *E. Park*[1], C. Gim[1], S. Jung[2] and Y. Kim[1] *1. Electric Engineering, Chosun University, Gwangju, The Republic of Korea; 2. Sungkyunkwan University, Suwon, The Republic of Korea*

GO-05. **A Novel Current-Excited Doubly Salient Machine.** Y. Mao[1] and *S. Niu*[1] *1. The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

GO-06. **Analytical Model of a Permanent Magnet Synchronous Motor With a Trapezoidal Halbach Array.** *X. Zhang*[1], C. Zhang[1] and L. Li[1] *1. Harbin Institute of Technology, Harbin, China*

GO-07. **Comparative Study of Partitioned Stator Memory Machines with Series and Parallel Hybrid PM Configurations.** *H. Yang*[1], Z. Zhu[2], H. Lin[1], S. Lyu[1] and Z. Pan[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. University of Sheffield, Sheffield, United Kingdom*

GO-08. **A Study on the Optimum Step Angle Considering the Three Dimensional Effect in Step Skew of Interior Permanent Magnet Motors through Finite Element.** S. Lee[1] and *W. Kim*[2] *1. Busan University of Foreign Studies, Busan, The Republic of Korea; 2. Gachon University, Seongnam, The Republic of Korea*

GO-09. **Electromagnetic Vibration Characteristic of High-Speed Permanent Magnet Synchronous Machines with Amorphous Metal Stator Cores.** *S. Wu*[1], W. Tong[1], S. Yu[1] and R. Tang[1] *1. Shenyang Universtiy of Technology, Shenyang, China*

GO-10. **Rotor Design and Optimization of a High-Speed Induction Machine Based on Multi-physical Constraints.** *X. Cheng*[1], W. Xu[2] and G. Du[2] *1. Institute of Electronic and Electrical Engineering, Shanghai University of Engineering Science, Shanghai, China; 2. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*

FRIDAY
MORNING
9:30

EXHIBIT HALL A

Session GP
MOTORS: MODELING AND SIMULATIONS VIII (Poster Session)

Omar Farrok, Chair
Ahsanullah University of Science & Technology, Dhaka, Bangladesh

GP-01. **Performance Analysis of a Hybrid Permanent Magnet V-Type Variable-Flux Machine.** *S. Zhang*[1], P. Zheng[1], M. Wang[1] and F. Liu[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

GP-02. **A Improved 24/14 Poles Stator Wound-Field Flux-Switching Machine Based on Virtual Coil Flux Linkages.** *W. Jiang*[1] and H. Wenxin[1] *1. College of Automation Engineering, Nanjing University of Aeronautics & Astronautics, Nanjing, China*

GP-03. **Withdrawn**

GP-04. **Design and Analysis of Efficiency Improvement through Reduction of Permanent Magnet Eddy Current of Ultra-High Speed Motors.** *H. Lee*[1], D. Jung[2] and J. Lee[2] *1. Electrical Automatization, BIST (Busan Institute of Science & Technology), Busan, The Republic of Korea; 2. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea*

GP-05. **6/4 pole permanent magnet auxiliary composite stator reluctance motor.** M. Zong[1], A. Liu[1], *J. Li*[1] and J. Lou[1] *1. Shenyang University of Technology, Shenyang, China*

GP-06. **Design and Optimization of an Outer-Rotor Six-Phase PM Vernier Machine with Outstanding Torque Performance.** *Y. Yao*[1] and C. Liu[1] *1. City University of HK, Hong Kong, Hong Kong*

GP-07. **A New Asymmetric Planar V-Shaped Magnet Arrangement for a Linear PM Synchronous Motor.** *A. Boduroglu*[1], Y. Demir[1] and M. Aydin[1,2] *1. R&D, MDS Motor Ltd., Kocaeli, Turkey; 2. Dept. of Mechatronics Engineering, Kocaeli University, Kocaeli, Turkey*

GP-08. **Comparative Study of Complementary-Stator Flux-Modulated PM Machines with Different Flux Modulation Pole Structures.** *J. Yu*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong*

GP-09. **Analysis on AC Copper Loss in IPMSM with Concentrated Windings according to Conductor Arrangement.** *S. Jun*[1], S. Seo[1], Y. Kim[2] and S. Jung[1] *1. Department of Electronics Electric Computer Engineering, Sungkyunkwan University, Suwon, The Republic of Korea; 2. Department of Electric Engineering, Chosun University, Gwangju, The Republic of Korea*

FRIDAY
MORNING
9:30

EXHIBIT HALL A

Session GQ
SKYRMIONS III
(Poster Session)

Anjan Soumyanarayanan, Chair
A*STAR, Singapore, Singapore

GQ-01. **Skyrmion meets magnetic tunnel junction: an efficient way for electrical skyrmion detection investigated by ab initio theory.** *J.F. Schaefer*[1], M. Czerner[1] and C. Heiliger[1] *1. Institut für Theoretische Physik, Justus-Liebig-Universität Giessen, Giessen, Germany*

GQ-02. **Control of a Skyrmion motion by an angelfish racetrack.** K. Migita[1], K. Yamada[2] and *Y. Nakatani*[1] *1. University of Electro-Communications, Tokyo, Japan; 2. Gifu University, Gifu, Japan*

GQ-03. **Electrical detection of artificial skyrmion in synthetic antiferromagnetic nanostructures at room temperature.** *F. Ma*[1], Q. Feng[2], S. Li[3], Y. Li[1], X. Jin[1], Q. Lu[2] and W. Lew[3] *1. School of Physics and Technology, Nanjing Normal University, Nanjing, China; 2. High Magnetic Field Laboratory, University of Science and Technology of China, Hefei, China; 3. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*

GQ-04. ***Current-driven Skyrmion dynamics along curved tracks.*** V. Raposo[1], R. Luis Martinez[1], O. Alejos[2] and *E. Martinez*[1] *1. Fisica Aplicada, University of Salamanca, Salamanca, Spain; 2. University of Valladolid, Valladolid, Spain*

GQ-05. **High dense Skyrmion lattice fabrication by magnetic force microscopy.** *A. Ognev*[1], A.S. Samardak[1], A. Kolesnikov[1], A.V. Sadovnikov[2,3], S. Nikitov[2,3], I. Soldatov[4], A. Talapatra[5], J. Mohanty[5], K. Yong Jin[6] and Y.K. Kim[6] *1. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Laboratory "Metamaterials", Saratov State University, Saratov, Russian Federation; 3. Kotel'nikov Institute of Radioengineering and Electronics, Moscow, Russian Federation; 4. Leibniz Institute for Solid State and Material Research (IFW-Dresden), Dresden, Germany; 5. Indian Institute of Technology, Hyderabad, India; 6. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea*

GQ-06. **Exploring skyrmion/antiskyrmion phase by magnetic entropy change measurements.** S. Manna[1], J. Sk[1] and *A.K. Nayak*[1] *1. National Institute of Science Education and Research, Bhubaneswar, India*

GQ-07. **Experimental demonstration of VCMA induced manipulation of magnetic skyrmions.** *D. Bhattacharya*[1], S. Razavi[2], H. Wu[2], K. Wang[2] and J. Atulasimha[1] *1. Virginia Commonwealth University, Richmond, VA, United States; 2. University of California at Los Angeles, Los Angeles, CA, United States*

GQ-08. **Skyrmion Lattice Ordering and Interactions in Thin-Film Multilayer Systems.** R. Gruber[1], J. Zazvorka[1], N. Kerber[1,2], M. Vafaee[1], K. Litzius[1,2], P. Virnau[1] and *M. Kläui*[1,2] *1. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 2. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany*

GQ-09. **Robust topological Hall effect driven by oxygen octahedral tilting in ultrathin $SrRuO_3$ single-layered films.** *Y. Gu*[1,2], Y. Wei[3], K. Xu[4], X. Zhong[4], C. Song[1], J. Feng[3], W. Liu[2], Z. Zhang[2], F. Pan[1] and J. Zhu[4] *1. Key Laboratory of Advanced Materials (MOE), School of Materials Science and Engineering, Tsinghua University, Beijing 100084, China, Beijing, China; 2. Shenyang National Laboratory for Materials Science, Institute of Metal Research, University of Chinese Academy of Sciences, Chinese Academy of Sciences, Shenyang 110016, China, Shenyang, China; 3. International Center for Quantum Materials, School of Physics, Peking University, Beijing 100871, China, Beijing, China; 4. National Center for Electron Microscopy in Beijing, Key Laboratory of Advanced Materials (MOE), The State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, China, Beijing, China*

Session GR
MULTIFERROICS AND COMPLEX OXIDES III (Poster Session)
Daniel Gopman, Chair
NIST, Gaithersburg, MD, United States

GR-01. **A Mössbauer study of $DyCrO_4$ and $ErCrO_4$.** G.A. Stewart[1], S. Cadogan[1], W. Hutchison[1] and *D. Ryan*[2] *1. School of Physical, Environmental and Mathematical Sciences, UNSW Canberra, Canberra, ACT, Australia; 2. Physics Department, McGill University, Montreal, QC, Canada*

GR-02. **Large negative magnetoelectric coupling in Fe substituted ferroelectric $Bi_{0.5}Na_{0.5}TiO_3$ ceramics: A combined experimental and theoretical study.** *M. Kumari*[1,2], S. Santapuri[1] and R. Chatterjee[1] *1. Physics Department, IIT Delhi, Hauz Khas, New Delhi, India; 2. Department of Applied Physics, Delhi Technological University, New Delhi, India*

GR-03. **Observation of electric domains in $InMn_{0.75}Fe_{0.25}O_3$: The influence of oxygen vacancies.** J. Liu[1,2], *Z. Wang*[1] and S. He[2] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China, Beijing, China; 2. Department of Physics, Capital Normal University, Beijing 100048, China, Beijing, China*

GR-04. **Phonon Invisibility Driven by Magnetic Ordering in $AlFeO_3$ Thin Film.** *S. Tyagi*[1] and V.G. Sathe[1] *1. Raman Laboratory, UGC DAE Consortium for Scientific Research, Indore, India*

GR-05. **Magnetic field at Ce impurities in La sites of $LaBaMn_2O_6$ double perovskites.** *B. Bosch-Santos*[1], N. Nascimento[1], M. Saiki[1], E.L. Correa[1], T.S. Sales[1], L.F. Pereira[1], G.A. Cabrera-Pasca[2] and A.W. Carbonari[1] *1. IPEN/USP, São Paulo, Brazil; 2. Física, Universidade Federal do Pará-Campus Abaetetuba, Abaetetuba, Brazil*

GR-06. **Engineering Magnetoresistance in (001)- and (111)-oriented $(La_{2/3}Sr_{1/3}MnO_3)_n/(LaFeO_3)_{10}$ Superlattices through Interfacial Coupling.** Y. Zhou[1,2] and *S.J. May*[2] *1. Materials Science and Engineering, Shandong University, Ji'nan, China; 2. Materials Science and Engineering, Drexel University, Philadelphia, PA, United States*

GR-07. **Study of the Local Magnetics and Electrics Properties at $Gd_2Ti_2O_7$ by PAC Spectroscopy and ab Initio Calculations.** E.L. Correa[1], L.F. Pereira[1], *W.L. Ferreira*[1], B. Bosch-Santos[1], L. Scalise[1], V. Gonçalves[1], R. dos Santos[1], J. Schell[2] and A.W. Carbonari[1,2] *1. Instituto de Pesquisas Energéticas e Nucleares, Universidade de São Paulo, São Paulo, Brazil; 2. ISOLDE, CERN, Geneve, Switzerland*

GR-08. **Tunneling Magneto-Dielectric Effects of Crystalized Co-BaF_2 Nano-granular Films at MHz Frequencies.** *H. Kijima-Aoki*[1], Y. Cao[1], Y. Endo[1], N. Kobayashi[2], S. Ohnuma[2,1] and H. Masumoto[1] *1. Tohoku University, Sendai, Japan; 2. Research Institute for Electromagnetic Materials, Tomiya, Japan*

GR-09. **Raman magnetic dependence in the quadrupole perovskite $(LaMn_3)Mn_4O_{12}$ at low temperature.** *A.J. Gualdi*[1], F. Perez[2], M. Verseils[3], C. Bellin[3], A.J. de Oliveira[1], E. Gilioli[4] and A. Gauzzi[3] *1. Physics, Federal University of São Carlos, São Carlos, Brazil; 2. INSP, Sorbonne Université, CNRS, IRD, MNHN, Paris, France; 3. IMPMC, Sorbonne Université, CNRS, IRD, MNHN, Paris, France; 4. Istituto dei Materiali per Elettronica e Magnetismo-CNR, Parma, Italy*

FRIDAY
MORNING
9:30

EXHIBIT HALL A

Session GS
MICROMAGNETIC AND HYSTERESIS MODELING II (Poster Session)

Hatem ElBidweihy, Chair
United States Naval Academy, Annapolis, MD, United States

GS-01. **Theoretical Study of Gilbert Damping in Magnetic Multilayer Film.** *D. Ozaki*[1], D. Miura[1] and A. Sakuma[1] *1. Department of Applied Physics, Tohoku University, Sendai, Japan*

GS-02. **Massively parallel atomistic spin dynamics and Monte Carlo simulations using VAMPIRE.** A. Meo[1], A. Laverack[1] and *R.F. Evans*[1] *1. Department of Physics, University of York, York, United Kingdom*

GS-03. **Analytical modeling of magnetization switching in amorphous glass-coated nanowires and submicron wires.** *T.A. Ovari*[1], C. Rotarescu[1], C. Hlenschi[1], H. Chiriac[1] and N. Lupu[1] *1. Department of Magnetic Materials and Devices, National Institute of Research and Development for Technical Physics, Iasi, Romania*

GS-04. **Withdrawn**

GS-05. **Effects of exchange interaction of grain boundary phase on hysteresis losses in magnetic thin film revealed by micromagnetic simulation.** *H. Tsukahara*[1], K. Iwano[1], C. Mitsumata[2], T. Ishikawa[1] and K. Ono[1] *1. High Energy Accelerator Research Organization, Tsukuba, Japan; 2. National Institute for Materials Science, Tsukuba, Japan*

GS-06. **Generalized Dynamic Hysteresis Model for Improved Iron Loss Estimation of Complex Flux Waveforms.** *L. Chang*[1] and T.M. Jahns[1] *1. Electrical and Computer Engineering, University of Wisconsin- Madison, Madison, WI, United States*

GS-07. **Dzyaloshinski-Moriya Micromagnetism.** *R. Skomski*[1] and D.J. Sellmyer[1] *1. Physics and Astronomy & NCMN, University of Nebraska, Lincoln, NE, United States*

GS-08. **Computing resonant modes and excitation states in micromagnetic systems with a finite-element based frequency domain solver.** Z. Lin[1], *X. Wang*[1] and V. Lomakin[1] *1. University of California- San Diego, La Jolla, CA, United States*

FRIDAY
AFTERNOON
1:30

SALON 2

Session HA
MAGNETISM RESEARCH USING X-RAY FREE ELECTRON LASERS
Peter Fischer, Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States

1:30

HA-01. **Energy and Angular Momentum Transfer during Ultrafast Demagnetization of Ferromagnetic Alloys.** ***(Invited)*** *E. Jal*[1], B. Vodungbo[1], F. Capotondi[2], G. Lambert[3], C. von korff Schmising[4] and J. Lüning[1] *1. LCPMR, Sorbonne Université, Paris, France; 2. Elettra-Sincrotrone Trieste, Trieste, Italy; 3. LOA, CNRS, Palaiseau, France; 4. MBI, Berlin, Germany*

2:06

HA-02. **Ultrafast energy- and momentum-resolved dynamics of magnetic correlations in the photo-doped Mott insulator Sr_2IrO_4.** ***(Invited)*** *M.P. Dean*[1] *1. Condensed Matter Physics and Materials Science, Brookhaven National Labatory, Upton, NY, United States*

2:42

HA-03. **Ultrafast correlations between spins, electrons and lattice studied by x-rays.** ***(Invited)*** *U. Staub*[1] *1. Swiss Light Source, Paul Scherrer Institute, Villigen, Switzerland*

3:18

HA-04. **Hot electron transport and ultrafast nonlocal magnetic response.** ***(Invited)*** *S. Eisebitt*[1] *1. Max Born Institute, Berlin, Germany*

3:54

HA-05. **Spontaneous Fluctuation of Skyrmions in FeGd Thin Film.** ***(Invited)*** *S. Roy*[1] *1. Advanced Light Source, Lawrence Berkeley National Lab, Berkeley, CA, United States*

Session HB

SPIN TRANSPORT & RELAXATION IN NANOSCALE MATERIALS AND DEVICES

Joseph Sklenar, Chair
University of Illinois Urbana-Champaign, Urbana, IL, United States

1:30

HB-01. **Record quality factor of 170,000 in mutually synchronized spin Hall nano-oscillator arrays.** *M. Zahedinejad*[1], A.A. Awad[1], S. Muralidhar[1], M. Dvornik[1] and J. Åkerman[1]
1. Physics, University of Gothenburg, Gothenburg, Sweden

1:42

HB-02. **High Write Endurance of over 10^{12} Cycles in Spin Current Type Magnetic Memory.** Y. Shiokawa[1], E. Komura[1], Y. Ishitani[1], A. Tsumita[1], K. Suda[1], Y. Kakinuma[1] and *T. Sasaki*[1]
1. Technology & Intellectual Property HQ, TDK Corporation, Ichikawa, Japan

1:54

HB-03. **Spin-currents and THz emission from optimized 3d/5d heavy metals interfaces.** T. Dang[1], H. Nong[2], J. Hawecker[2], Q. Barbedienne[1], V. Volpe[1], J. George[1], S. Collin[1], P. Bortolotti[3], L. Vila[4], J. Tignon[2], S. Dhillon[2] and *H. Jaffres*[1]
1. Unité Mixte de Physique CNRS-Thales, CNRS, Palaiseau, France; 2. LPA, ENS, Paris, France; 3. Thales Research and Technology, Thales, Palaiseau, France; 4. CEA-SPINTEC, CEA, Grenoble, France

2:06

HB-04. **Synchronization of spin-torque oscillators via spin pumping.** *T. Taniguchi*[1] *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

2:18

HB-05. **Elliott-Yafet Scaling in Cu Non-Local Spin Valves and the Impact of Magnetic Impurities.** *J.D. Watts*[1,2], L. O'Brien[3,2], J.S. Jeong[2], A. Mkhoyan[2], P.A. Crowell[1] and C. Leighton[2]
1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 3. Physics, University of Liverpool, Liverpool, United Kingdom

2:30

HB-06. **Separating Spin and Charge Effects in Non-local Transport Driven By the Spin Hall Effect.** D. Wesenberg[1], R. Bennet[1], M. Roos[1], T. Liu[2], M. Wu[2] and *B.L. Zink*[1] *1. Physics & Astronomy, University of Denver, Denver, CO, United States; 2. Physics, Colorado State University, Fort Collins, CO, United States*

2:42

HB-07. **Spin-orbit effects and hot-carrier transport in graphene-based devices.** ***(Invited)*** L.A. Benitez[1,2], J.F. Sierra[1], W. Savero-Torres[1], F. Bonell[1], A. Arrighi[1,2], M.V. Costache[1] and *S.O. Valenzuela*[1,3] *1. Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC-BIST, Bellaterra, Spain; 2. Universidad Autonoma de Barcelona, Bellaterra, Spain; 3. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain*

3:18

HB-08. **Cascaded All-Carbon Spin Logic based on Graphene Nanoribbon Magnetoresistance.** *J.S. Friedman*[1] *1. Electrical & Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States*

3:30

HB-09. **Proximity magneto-resistance in graphene induced by magnetic insulators.** *D.A. Solis*[2], A. Hallal[2], X. Waintal[1] and M. Chshiev[1] *1. Univ. Grenoble Alpes, INAC-SPSMS/ CEA, Grenoble, France; 2. SPINTEC, Univ. Grenoble Alpes, CNRS, CEA-INAC, Grenoble, France*

3:42

HB-10. **Unravelling Dzyaloshinskii–Moriya interaction and chiral nature of Graphene/Cobalt interface.** F. Ajejas[1], A. Gudin[1], J. Diez[1,2], P. Olleros[1], L. de Melo Costa[1], A. Anadon[1], R. Guerrero[1], S. Pizzini[3], J. Vogel[3], M. Valvidares[4], P. Gargiani[4], M. Varela[5], J. Camarero[1,2], R. Miranda[1,2] and *P. Perna*[1] *1. IMDEA Nanociencia, Madrid, Spain; 2. Universidad Autonoma de Madrid, Madrid, Spain; 3. Institut Néel, Grenoble, France; 4. ALBA synchrotron, Cerdanyola del Valles, Spain; 5. Universidad Complutense de Madrid, Madrid, Spain*

3:54

HB-11. **Self-Stabilizing Superfluidic Transport in Magnetic Thin Films in the Presence of Non-Local Dipole-Dipole Interactions.** *T. Schneider*[1,2], D.M. Hill[3], A. Kakay[1], K. Lenz[1], J. Lindner[1], J. Fassbender[1], Y. Tserkovnyak[3], I. Krivorotov[4] and I. Barsukov[5] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Department of Physics, TU Chemnitz, Chemnitz, Germany; 3. Department of Physics and Astronomy, University of Californa, Los Angeles, Los Angeles, CA, United States; 4. Physics and Astronomy, University of California, Irvine, Irvine, CA, United States; 5. Physics and Astronomy, University of California, Riverside, Riverside, CA, United States*

4:06

HB-12. **Oxygen as key element for the correlation of bistability and magnetoresistance in organic spintronic devices.** *I. Bergenti*[1], F. Borgatti[1], A. Riminucci[1] and V.A. Dediu[1] *1. ISMN-CNR, Bologna, Italy*

Session HC
SKYRMIONS IV
Sophie Morley, Chair
University of California - Santa Cruz, Santa Cruz, CA, USA

1:30

HC-01. Generation of skyrmion bubbles in all-perpendicular nanocontact spin-torque oscillators. *M. Ahlberg*[1], S. Chung[2,3], T.Q. Le[2], H. Mazraati[2], A. Houshang[1], S. Jiang[2], A.T. Nguyen[5], M. Weigand[4], E.J. Goering[4], G.A. Schütz[4], J. Gräfe[4] and J. Åkerman[1,2] *1. University of Gothenburg, Gothenburg, Sweden; 2. KTH Royal Institute of Technology, Stockholm, Sweden; 3. Uppsala University, Uppsala, Sweden; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. Vietnam Academy of Science and Technology, Hanoi, Vietnam*

1:42

HC-02. Current-induced dynamics of magnetic skyrmions in ultrathin Pt/Co/MgO nanostructures. *R. Juge*[1], S. Je[1], D. de Souza Chaves[2], S. Pizzini[2], L.D. Buda-Prejbeanu[1], L. Aballe[3], M. Foerster[3], A. Locatelli[4], T.O. Mentes[4], F. Maccherozzi[5], S.S. Dhesi[5], S. Auffret[1], G. Gaudin[1], J. Vogel[2] and O. Boulle[1] *1. INAC-SPINTEC, Université Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France; 2. Institut Néel, Université Grenoble Alpes, CNRS, Grenoble, France; 3. Circe Beamline, ALBA Synchrotron, Cerdanyola del Vallès, Barcelona, Spain; 4. Nanospectroscopy Beamline, Elettra Synchrotron, Basovizza, Trieste, Italy; 5. I06 Beamline, Diamond Light Source, Didcot, United Kingdom*

1:54

HC-03. Zero Field Room Temperature Magnetic Skyrmions in Ultrathin Magnetic Layers using Exchange Bias. *K. Rana*[1], R. Juge[1], D. de Souza Chaves[2], S. Pizzini[2], S.L. Denmat[2], L. Aballe[3], M. Foerster[3], A. Locatelli[4], T.O. Mentes[4], S. Auffret[1], G. Gaudin[1], O. Fruchart[1], J. Vogel[2] and O. Boulle[1] *1. SPINTEC, CEA-INAC, CNRS, Université Grenoble Alpes, Grenoble INP, Grenoble, France; 2. Institut Néel, CNRS, Université Grenoble Alpes, Grenoble, France; 3. ALBA Synchrotron Light Facility, Cerdanyola Del Vallès, Barcelona, Spain; 4. Elettra Sincrotrone, Trieste, Italy*

2:06

HC-04. Thermally assisted skyrmions creation in Pt/Co/Ta multilayer films. *S. Zhang*[1], J. Zhang[1], Y. Wen[1], E.M. Chudnovsky[2] and X. Zhang[1] *1. Physical Science and Engineering Division (PSE), King Abdullah University of Science & Technology, Thuwal, Saudi Arabia; 2. The City University of New York, New, NY, United States*

2:18

HC-05. **Skyrmions and Skyrmion-bubbles in Ultrathin Films Modified by Ga^+ Ion Irradiation.** *A.S. Samardak*[1], A. Kolesnikov[1], E. Pustovalov[1], A.V. Sadovnikov[2,3], S. Nikitov[2,3] and A. Ognev[1] *1. School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Laboratory "Metamaterials", Saratov State University, Saratov, Russian Federation; 3. Kotel'nikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russian Federation*

2:30

HC-06. **Realization of magnetic skyrmions in thin films at ambient conditions.** *L. DeBeer-Schmitt*[1], R.D. Desautels[1], S.A. Montoya[2], J. Borchers[3], S. Je[4], M. Im[4,5], M. Fitzsimmons[1], E. Fullerton[6] and D.A. Gilbert[7] *1. Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 2. Space and Naval Warfare Systems Center Pacific, San Diego, CA, United States; 3. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 4. Center for X-ray Optics, Lawrence Berkeley National Laboratory, Berkely, CA, United States; 5. Department of Emerging Materials Science, Daegu Gyeongbuk Institute of Science and Technology, Daegu, The Democratic People's Republic of Korea; 6. Center for Memory and Recording Research, University of California, San Diego, La Jolla, CA, United States; 7. Department of Materials Engineering, University of Tennessee, Knoxville, TN, United States*

2:42

HC-07. **Investigating the physics of skyrmions in ultrathin ferromagnets with a scanning-NV magnetometer.** *M. Akthar*[1], A. Hrabec[2,3], A. Haykal[1], I. Gross[1], S. Chouaieb[1], M. Belmeguenai[4], M. Gabor[5], P. Maletinsky[6], J. Sampaio[2], A. Thiaville[2], S. Rohart[2] and V. Jacques[1] *1. L2C, CNRS and Université Montpellier, Montpellier, France; 2. LPS, CNRS and Université Paris Saclay, Orsay, France; 3. ETH, Zurich, Switzerland; 4. LSPM, CNRS and Université Paris 13, Villetaneuse, France; 5. Technical University of Cluj-Napoca, Cluj-Napoca, Romania; 6. Basel University, Basel, Switzerland*

2:54

HC-08. **Enhanced Skyrmion Stability Induced by Antiferromagnetic Coupling in Ferrimagnets.** *C.T. Ma*[1], Y. Xie[2], A. Ghosh[2] and J. Poon[1] *1. Physics, University of Virginia, Charlottesville, VA, United States; 2. Electrical and Computer Engineering, University of Virginia, Charlottesville, VA, United States*

3:06

HC-09. **Temperature-dependent motion and size of ferrimagnetic skyrmions.** *Z. Zhang*[1], Y. Zhang[1], Z. Zheng[1], J. Nan[1], K. Zhang[1], Y. Zhang[1] and W. Zhao[1] *1. Beihang University, Beijing, China*

3:18

HC-10. **Current-Induced Stochastic Skyrmion Dynamics for Reservoir Computing.** *S. Li*[1,2], J. Bai[1], W. Kang[1] and W. Zhao[1] *1. Fert Beijing Institute, BDBC, and School of Electronic and Information Engineering, Beihang University, Beijing, China; 2. Shenyuan Honors College of Beihang University, Beijing, China*

3:30

HC-11. **Topological Hall effect in diffusive ferromagnetic thin films with spin-flip scattering.** *S. Zhang*[1] and O. Heinonen[1,2] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Northwestern-Argonne Institute of Science and Technology, Evanston, IL, United States*

3:42

HC-12. **Spin colossal magnetoresistance.** *Z. Qiu*[1], D. Hou[2], J. Barker[2], K. Yamamoto[3], O. Gomonay[4] and E. Saitoh[5] *1. School of Materials Science and Engineering, Dalian University of Technology, Dalian, China; 2. Tohoku University, Sendai, Japan; 3. Japan Atomic Energy Agency, Tokai, Japan; 4. Johannes Gutenberg Universität Mainz, Mainz, Germany; 5. University of Tokyo, Tokyo, Japan*

3:54

HC-13. **Non-local spin transport via sustained noncollinear textures in ferromagnetic nanowires.** *E. Iacocca*[1,2], T. Silva[2] and M. Hoefer[1] *1. Applied Mathematics, University of Colorado, Boulder, CO, United States; 2. NIST, Boulder, CO, United States*

4:06

HC-14. **Interfacial Coupling and Negative Spin Hall Magnetoresistance in Pt/NiO/YIG.** *Z. Luan*[1], F. Chang[2,4], P. Wang[1], L. Zhou[1], J. Cooper[3], C. Kinane[3], S. Langridge[3], J. Cai[2], J. Du[1], T. Zhu[2] and D. Wu[1] *1. Nanjing University, Nanjing, China; 2. Chinese Academy of Sciences, Beijing, China; 3. ISIS Neutron and Muon Source, Oxon, United Kingdom; 4. Dongguan Neutron Science Cente, Dongguan, China*

4:18

HC-15. **Room temperature observation of different skyrmion phases in double wedges of Ta/FeCoB(t_{FeCoB})/Ta(t_{Ta})Ox.** *T. Srivastava*[1], W. Lim[1], A. Bernand-Mantel[2], L. Ranno[2], S. Pizzini[2], M. Belmeguenai[3], Y. Roussigné[3], S. Auffret[1], M. Chshiev[1], C. Baraduc[1] and H. Bea[1] *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec, Grenoble, France; 2. Univ. Grenoble Alpes, CNRS, Institut Néel, Grenoble, France; 3. Laboratoire des Sciences des Procédés et des Matériaux, Université Paris 13 Nord, Villetaneuse, France*

Session HD
SPIN TORQUE OSCILLATORS AND SPIN WAVES

Bhaskaran Muralidharan, Chair
Indian Institute of Technology, India, India

1:30

HD-01. **Spin transfer torque driven higher-order propagating spin waves in nano-contact magnetic tunnel junctions. *(Invited)*** *J. Åkerman*[1], A. Houshang[1], R. Khymyn[1], H. Fulara[1], A. Gangwar[1], M. Haidar[1], S.R. Etesami[1], R. Ferreira[2], P.P. Freitas[2] and M. Dvornik[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. INL - International Iberian Nanotechnology Laboratory, Braga, Portugal*

2:06

HD-02. **Identification of spin wave modes in perpendicular MTJs devices by field modulated spin-torque ferromagnetic resonance.** J. Hang[1], J. Beik Mohammadi[1], G. Wolf[2], B. Kardasz[2], S. Petit-Watelot[3], *S. Mangin*[3] and A.D. Kent[1] *1. Physics, New York University, New York, NY, United States; 2. Spin Transfer Technologies, Fremont, CA, United States; 3. Institut Jean Lamour, Nancy, France*

2:18

HD-03. **Resonant acoustic wave assisted spin-transfer-torque switching of single domain nanomagnets.** *A. Roe*[1], M. Azam[1], D. Bhattacharya[1] and J. Atulasimha[1] *1. Virginia Commonwealth Univ., Richmond, VA, United States*

2:30

HD-04. **Edge state of nanoscale magnetic tunnel junctions proved by spin-wave resonance.** *M. Shinozaki*[1], T. Dohi[1], J. Igarashi[1], J. Llandro[1,2], S. Kanai[1,2], S. Fukami[1,2], H. Sato[1,2] and H. Ohno[1,2] *1. RIEC, Tohoku University, Sendai, Japan; 2. CSRN, Tohoku University, Sendai, Japan*

2:42

HD-05. **Comparison of the spin-transfer torque mechanisms efficiency in a three-terminal spin-torque oscillator.** *E. Jué*[1], W. Rippard[1] and M. Pufall[1] *1. National Institute of Standards and Technology, Boulder, CO, United States*

2:54

HD-06. **Demonstration of rf functions for spin torque oscillators based on fully perpendicular magnetic tunnel junctions.** *V. Iurchuk*[1], N. Lamard[1], J. Langer[2], J. Wrona[2], I. Prejbeanu[1], L. Vila[1], R.C. Sousa[1] and U. Ebels[1] *1. Univ. Grenoble Alpes, CEA, CNRS, G-INP*, INAc-SPINTEC, * Institute of Engineering Univ. Grenoble Alpes, SPINTEC, Grenoble, France; 2. Singulus Technologies AG, Kahl, Germany*

3:06

HD-07. **Role of non-linearity for 1/f flicker noise in vortex spin transfer nanooscillators.** *S. Wittrock*[1], S. Tsunegi[2], K. Yakushiji[2], A. Fukushima[2], H. Kubota[2], P. Bortolotti[1], U. Ebels[3], S. Yuasa[2], G. Cibiel[4], S. Galliou[5], E. Rubiola[5] and V. Cros[1] *1. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 2. National Institute of Advanced Industrial Science and Technology (AIST), Spintronics Research Center, Tsukuba, Japan; 3. Univ. Grenoble Alpes, CEA, INAC-SPINTEC, CNRS, SPINTEC, Grenoble, France; 4. Centre National d'Etudes Spatiales (CNES), Toulouse, France; 5. FEMTO-ST Institute, CNRS, Université Bourgogne Franche Comté, Besancon, France*

3:18

HD-08. **Phase-locking and modulation of nanocontact vortex oscillators.** J. Letang[1], M. Yoo[1], T. Devolder[1], J. Adam[1], S. Petit-Watelot[2], M. Hehn[2], K. Bouzehouane[3], V. Cros[3] and *J. Kim*[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, Palaiseau, France; 2. Institut Jean Lamour, CNRS, Université de Lorraine, Nancy, France; 3. Unité Mixte de Physique, CNRS, Thales, Université Paris-Sud, Université Paris-Saclay, Palaiseau, France*

3:30

HD-09. **Evaluation of short-term memory of spin torque oscillator with random voltage pulses.** S. Tsunegi[1], *T. Taniguchi*[1], S. Miwa[2], K. Nakajima[3], K. Yakushiji[1], A. Fukushima[1], S. Yuasa[1] and H. Kubota[1] *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. The Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 3. Graduate School of Information Science and Technology, The University of Tokyo, Bunkyo-ku, Japan*

3:42

HD-10. **Phase shift keying in spin torque oscillators.** A. Litvinenko[1], *P. Sethi*[1], C. Murapaka[1], A. Jenkins[2], L. Vila[1], V. Cros[3], P. Bortolotti[4], R. Ferreira[2], B. Dieny[1] and U. Ebels[1] *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec, Grenoble, France; 2. International Iberian Nanotechnology Laboratory, Braga, Portugal; 3. Unité Mixte de Physique CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; 4. Thales TRT, Palaiseau, France*

3:54

HD-11. **Nonlinear dynamics of spin-torque nano-oscillators with delayed feedback.** *J. Williame*[1], D. Rontani[2], S. Petit-Watelot[3], M. Sciamanna[2] and J. Kim[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; 2. Laboratoire Matériaux Optiques, Photonique et Systèmes, CentraleSupelec, Université de Lorraine, Metz, France; 3. Institut Jean Lamour, CNRS, Université de Lorraine, Nancy, France*

4:06

HD-12. **In-line Spin Wave Majority Gate.** *G. Talmelli*[1,2], T. Devolder[3], M. Heyns[1,2], I.P. Radu[1], C. Adelmann[1] and F. Ciubotaru[1] *1. imec, Leuven, Belgium; 2. KU Leuven, Leuven, Belgium; 3. Centre de Nanosciences et de Nanotechnologies, Univ.Paris-Sud, Orsay, France*

4:18

HD-13. **A fast coupled Landau-Lifshitz-Gilbert - Valet-Fert theory framework for micromagnetics.** *X. Wang*[1], A. Goncharov[2] and V. Lomakin[1] *1. Department of Electrical Computer Engineering, University of California, San Diego, La Jolla, CA, United States; 2. HGST, a Western Digital Company, San Jose, CA, United States*

FRIDAY AFTERNOON 1:30 — VIRGINIA

Session HE
SPINWAVES AND SPIN DYNAMICS
Philipp Pirro, Chair
TU Kaiserslautern, Kaiserslautern, Germany

1:30

HE-02. **Spin-wave nonreciprocity on magnetization-graded ferromagnetic films.** *R. Gallardo*[1,5], P. Alvarado[1], T. Schneider[2,3], C.A. Gonzalez[1], A. Roldán[4], K. Lenz[2], J. Lindner[2] and P. Landeros[1,5] *1. Física, Universidad Técnica Federico Santa María, Valparaíso, Chile; 2. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. Department of Physics, Technische Universität Chemnitz, Dresden, Germany; 4. Universidad de Aysén, Coyhaique, Chile; 5. Center for the Development of Nanoscience and Nanotechnology (CEDENNA), Santiago, Chile*

1:42

HE-03. **Theory of Emission of Coherent Spin Waves from Magnetic Interfaces Driven by a Uniform Microwave Magnetic Field.** *V. Poimanov*[1], A.N. Kuchko[2,3] and V.V. Kruglyak[4] *1. Donetsk National University, Donetsk, Ukraine; 2. Institute of Magnetism, Kiev, Ukraine; 3. Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine; 4. University of Exeter, Exeter, United Kingdom*

1:54

HE-04. **Element specific time resolved visualization of spin wave modes with 50 nm resolution using Scanning Transmission X-ray Microscopy Ferromagnetic Resonance.** *T. Feggeler*[1], T. Schaffers[2], S. Pile[2], B.W. Zingsem[1,3], C. Schöppner[1], R. Meckenstock[1], D. Spoddig[1], H. Ohldag[4], A. Ney[2], M. Farle[1], H. Wende[1] and K.J. Ollefs[1] *1. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2. Institute of Semiconductor and Solid State Physics, Johannes Kepler University, Linz, Austria; 3. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons, Forschungszentrum Jülich GmbH, Jülich, Germany; 4. Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory, Menlo Park, CA, United States*

2:06

HE-05. **X-ray microscopic imaging of sub-100 nm magnons.** *N. Traeger*[1], P. Gruszecki[2], F. Lisiecki[3], J. Förster[1], F. Gross[1], M. Weigand[1], P. Kuswik[3,4], J. Dubowik[3], G.A. Schütz[1], M. Krawczyk[2] and J. Gräfe[1] *1. Modern Magnetic Systems, Max-Planck-Institute for Intelligent Systems, Stuttgart, Germany; 2. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 3. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland; 4. Centre for Advanced Technology, Adam Mickiewicz University, Poznan, Poland*

2:18

HE-06. **Improving Excitation and Detection of Propagating Spiral Spin Waves in Magnetic Nano-patches: Influence of Thickness and Shape.** *D. Osuna Ruiz*[1], E.O. Burgos Parra[1], N. Bukin[1], A. Lara[2], F.G. Aliev[2], A.P. Hibbins[1] and F.Y. Ogrin[1] *1. University of Exeter, Exeter, United Kingdom; 2. Universidad Autonoma de Madrid, Madrid, Spain*

2:30

HE-07. **Spin-Wave Modes in sub-100 nm YIG Waveguides.** *A. Chumak*[1], Q. Wang[1], B. Heinz[1], R.V. Verba[2], M. Kewenig[1], P. Pirro[1], M. Schneider[1], B. Lägel[1], C. Dubs[3] and T. Brächer[1] *1. University of Kaiserslautern, Kaiserslautern, Germany; 2. Institute of Magnerism, Kyiv, Ukraine; 3. INNOVENT e.V., Jena, Germany*

2:42

HE-08. **Lateral thermal gradient on a YIG film/GGG system in a uniform excitation.** *E. Shigematsu*[1], Y. Ando[1], S. Dushenko[2], T. Shinjo[1] and M. Shiraishi[1] *1. Department of Electronic Science and Engineering, Kyoto University, Kyoto, Japan; 2. Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, MD, United States*

2:54

HE-09. **Time-resolved imaging of the field- and current-induced domain wall motion dynamics in perpendicularly magnetized materials with sub-200 ps resolution.** *S. Finizio*[1], S. Wintz[1,2], K. Zeissler[3], S. Mayr[1], D. Bracher[1], A. Kleibert[1], C.H. Marrows[3] and J. Raabe[1] *1. Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland; 2. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

3:06

HE-10. **Magnetization Dynamics of Single NiFe Elements Measured Driven by Spin Torque.** *S. Lendinez*[1], T. Polakovic[2], J. Ding[1], M. Jungfleisch[3], J. Pearson[1], A. Hoffmann[1] and V. Novosad[1] *1. Materials Science Division, Argonne National Laboratory, Argonne, IL, United States; 2. Physics Divison, Argonne National Laboratory, Argonne, IL, United States; 3. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States*

3:18

HE-11. **Off-Resonance Excitation of Spin Waves by a Thermal Four-Magnon Process.** *R.D. McMichael*[1] and P.M. Haney[1] *1. Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, MD, United States*

3:30

HE-12. **Resonant properties of individual chains of dipolar coupled nanomagnets.** *B.W. Zingsem*[1,2], T. Feggeler[1], A. Terwey[1], S. Ghaisari[3], D. Spoddig[1], D. Faivre[3], R. Meckenstock[1], M. Farle[1] and M. Winklhofer[4] *1. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2. Ernst Ruska Centre for Microscopy and Spectroscopy with Electrons and Peter Gruuenberg Institute, Forschungszentrum Juelich GmbH, Juelich, Germany; 3. Department of Biomaterials, Max-Planck Institute of Colloids and Interface Science, Golm, Germany; 4. School of Mathematics and Science, University of Oldenburg, Oldenburg, Germany*

3:42

HE-13. **Earthquake-like dynamics of weakly-driven domain walls in ultrathin magnetic film.** *G. Durin*[1], A. Casiraghi[1], L. Herrera Diez[2], D. Ravelosona[2], L. Foini[3] and A. Rosso[4] *1. INRiM, 10135 Torino, Italy; 2. Centre de Nanosciences et de Nanotechnologies, CNRS, 91405 Orsay, France; 3. Laboratoire de Physique Statistique, Ecole Normale Supérieure, 75005 Paris, France; 4. LPTMS, 91405 Orsay, France*

3:54

HE-14. **Wire-edge-dependent magnetic domain wall creep.** *L. Herrera Diez*[1], V. Jeudy[2], G. Durin[3], A. Casiraghi[3], Y. Liu[1], M. Voto[4], G. Agnus[1], D. Bouville[1], L. Vila[5], J. Langer[6], B. Ocker[6], L. Lopez-Diaz[4] and D. Ravelosona[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Orsay, France; 2. Laboratoire de Physique des Solides, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Orsay, France; 3. Istituto Nazionale di Ricerca Metrologica, Torino, Italy; 4. Departamento de Fisica Aplicada, Universidad de Salamanca, Salamanca, Spain; 5. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec, Grenoble, France; 6. Singulus Technology AG, Kahl am Main, Germany*

4:06

HE-15. **Exploration of Topological Defects in Kagome Artificial Spin Ice via Spin Wave Spectroscopy, Magnetic Force Microscopy and micro-focus Brillouin Light Scattering.** *V.S. Bhat*[1], K. Baumgärtl[1], S. Watanabe[1] and D. Grundler[1] *1. Institute of Materials and Laboratory of Nanoscale Magnetic Materials and Magnonics, École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*

FRIDAY AFTERNOON 1:30 | DELAWARE

Session HF
NOVEL SENSOR ARCHITECTURES AND APPLICATIONS
Evangelos Hristoforou, Chair
National Technical University of Athens, Athens, Greece

1:30

HF-01. **Low-noise Orthogonal Fluxgate using Flipped-Current Joule Annealing.** *M. Butta*[1], M. Janosek[1] and B. Schutte[1] *1. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia*

1:42

HF-02. **Non-retangular shaped magnetoelastic ribbons for the accurate detection of pathogen agents.** *A. Lopes*[1], P.G. Saiz[1], A. Lasheras[2], A. Muela[2] and J. Gutierrez[2] *1. BCMaterials, Leioa, Spain; 2. UPV/EHU- Universidad del País Vasco, Leioa, Spain*

1:54

HF-03. **Additive Manufactured and Topology Optimized Passive Shimming Elements for Permanent Magnetic Systems.** *C. Huber*[1,4], M. Goertler[3], C. Abert[1], F. Bruckner[1,4], M. Groenefeld[2], I. Teliban[2] and D. Suess[1,4] *1. Physics of Functional Materials, University of Vienna, Vienna, Austria; 2. Magnetfabrik Bonn GmbH, Bonn, Germany; 3. Institute for Surface Technologies and Photonics, Joanneum Research Forschungsgesellschaft GmbH, Niklasdorf, Austria; 4. Christian Doppler Laboratory for Advanced Magnetic Sensing and Materials, Vienna, Austria*

2:06

HF-04. **Calibration of Room-Temperature Magnetic Sensor Arrays for Biomagnetic Measurement.** *Y. Adachi*[1], D. Oyama[1], Y. Terazono[2], T. Hayashi[2], T. Shibuya[2] and S. Kawabata[3] *1. Applied Electronics Laboratory, Kanazawa Institute of Technology, Kanazawa, Japan; 2. Advanced Product Develop Center, TDK Coporation, Tokyo, Japan; 3. Department of Advanced Technology in Medicine, Tokyo Medical and Dental University, Tokyo, Japan*

2:18

HF-05. **Highly Compliant Planar Hall Effect Sensor With Sub 50 nT Sensitivity.** P.N. Granell[1,2], G. Wang[1], G.S. Cañon Bermudez[1], T. Kosub[1], F. Golmar[3,4], L. Steren[4,5], J. Fassbender[1] and *D. Makarov*[1] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Instituto Nacional de Tecnología Industrial, San Martín, Argentina; 3. Universidad Nacional de San Martín, San Martín, Argentina; 4. CONICET, Buenos Aires, Argentina; 5. Instituto de Nanociencia y Nanotecnología, San Martín, Argentina*

2:30

HF-06. **Low power in-situ calibration of a 3 axial magnetic sensor.** *E. Weiss*[1], A. Shavit[2], R. Alimi[1] and E. Fisher[1] *1. Technology, Soreq NRC, Yavne, Israel; 2. School of Computer Science and Engineering, Hebrew University of Jerusalem, Jerusalem, Israel*

2:42

HF-07. **Suspended Magnetoelectric Heterostructures as Resonators for Magnetic Field Detection.** ***(Invited)*** *S.P. Bennett*[2], M. Staruch[2], J.W. Baldwin[1], B. Matis[1], K. Bussmann[2] and P. Finkel[2] *1. Acoustics Division, The U.S. Naval Research Laboratory, Washington, DC, United States; 2. Materials Science and Technology Division, The U.S. Naval Research Laboratory, Washington, DC, United States*

3:18

HF-08. **Performance-Enhancing Anchor Design for NEMS Magnetoelectric antennas.** *X. Liang*[1], H. Chen[1], N. Sun[1], C. Tu[1], Y. Wei[1], C. Dong[1], Y. He[1], Y. Zhang[1,2], H. Lin[1] and N. Sun[1] *1. ECE, Northeastern University, Boston, MA, United States; 2. Sichuan University, Chengdu, China*

3:30

HF-09. **NEMS Direct ME Coupling Simulation and Demonstration.** *H. Lin*[1], N. Sun[1], X. Liang[1] and N.X. Sun[1] *1. Northeastern University, Boston, MA, United States*

3:42

HF-10. **Performance enhancement of a conformal antenna on a conductive substrate using a high-impedance magnetic metasurface layer.** *I. Lisenkov*[1], V. Tyberkevych[2], A.N. Slavin[2] and N. Sun[1] *1. Electrical and Computer Engineering Department, Northeastern University, Boston, MA, United States; 2. Department of Physics, Oakland University, Rochester, MI, United States*

3:54

HF-11. **Flexible Hall sensors based on laser induced graphene.** *A. Kaidarova*[1], S. Aldhurais[1], D. Lago-Cachón[1], W. Zhang[1], A. Almansouri[1], L. Swanepoel[1], M. Khan[1], Y. Mashraei[1], U. Buttner[1] and J. Kosel[1] *1. Computer, Electrical and Mathematical Sciences & Engineering, King Abdullah University of Science and Technology (KAUST), Jeddah, Saudi Arabia*

4:06

HF-12. **2-Axis magnetic planar Hall effect sensor with pico-Tesla resolution.** *H. Nhalil*[1], P.T. Das[1], A. Grosz[2], V. Mor[1] and L. Klein[1] *1. Physics, Bar-Ilan University, Ramat Gan, Israel; 2. Department of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel*

FRIDAY AFTERNOON 1:30 | WASHINGTON 1

Session HG
TOPOLOGICAL INSULATORS AND MAGNETISM IN 2D MATERIALS

Alexander Grutter, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

1:30

HG-01. **Investigating magnetic order in magnetically doped topological insulator heterostructures.** *L.B. Duffy*[1,2] *1. Condensed Matter Physics, University of Oxford, Oxford, United Kingdom; 2. Rutherford Appleton Laboratory, Oxford, United Kingdom*

1:42

HG-02. **Effect of spin-orbit coupling and magnetic strength on Weyl semimetallic and Chern insulating phase of magnetic Bi_2MnX_4 (X= Se, Te).** *S. Chowdhury*[1], K. Garrity[1] and F. Tavazza[1] *1. NIST, Gaithersburg, MD, United States*

1:54

HG-03. **Strain-induced nonlinear spin Hall effect in topological Dirac semimetal.** *Y. Araki*[1,2] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan*

2:06

HG-04. **Significant Dzyaloshinskii–Moriya Interaction at Graphene–Ferromagnet Interfaces due to the Rashba Effect.** ***(Invited)*** *A.K. Schmid*[1] *1. Molecular Foundry, Lawrence Berkeley Lab, Berkeley, CA, United States*

2:42

HG-05. **Room temperature ferromagnetism and exchange bias effect in magnetic van der Waals heterostructures.** V. Kalappattil[1], R. Das[1], T. Eggers[1], M. Bonilla[1], S. Kolekar[1], M. Batzill[1] and *M. Phan*[1] *1. Physics, University of South Florida, Tampa, FL, United States*

2:54

HG-06. **Magnetic and Electronic Properties of Exfoliated $Fe_{2.7}GeTe_2$ Nanoflakes.** W. Kim[1], D. Kim[1], Y. Liu[2], C. Petrovic[2], C. Jang[1], H. Ryu[1] and *J. Choi*[1] *1. KIST, Seoul, The Republic of Korea; 2. Brookhaven National Laboratory, Upton, NY, United States*

3:06

HG-07. **First principles parameterization and atomistic spin dynamics of CrI_3 Van der Waals magnets.** *R.F. Evans*[1], E. Navarro-Moratalla[2] and E.G. Santos[3] *1. Department of Physics, University of York, York, United Kingdom; 2. Department of Physics, Massachusetts Institute of Technology, Cambridge, MA, United States; 3. School of Mathematics and Physics, Queens University Belfast, Belfast, United Kingdom*

3:18

HG-08. **Critical region phase transitions in the quasi-2D magnet $CrCl_3$.** *N. Bykovetz*[1], A. Hoser[2] and C. Lin[1] *1. Physics, Temple University, Philadelphia, PA, United States; 2. Dept. Operation Reactor BER II, Helmholtz-Zentrum Berlin, Berlin, Germany*

3:30

HG-09. **Magnetic Properties of Transition Metal Doped MoS_2 Nano Sheets.** L.M. Martinez[1], J.A. Delgado[1], C.L. Saiz[1], A. Cosio[1], K. Gandha[2], C.I. Nlebedim[2] and *S. Singamaneni*[1] *1. Physics, University of Texas at El Paso, El Paso, TX, United States; 2. Ames Laboratory, Critical Materials Institute, Ames, IA, United States*

3:42

HG-10. **Influence of Cobalt Substitution on the Magnetism of $NiBr_2$.** *B.K. Rai*[1], A. Christianson[1] and A. May[1] *1. Materials Science and Technology Division, Oak Ridge National Lab, Oak Ridge, TN, United States*

3:54

HG-11. **Unique Raman Capabilities for Investigating Magnetic Layered MPS_3 Materials.** *A. McCreary*[1], J.R. Simpson[1], J. Cao[2], J.E. Douglas[1], R. Shull[1], C. Dennis[1], X. Ling[2] and A.R. Hight Walker[1] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Boston University, Boston, MA, United States*

4:06

HG-12. **A novel study on soft ferromagnetic nature of molybdenum sulphide (MoS_2) nano flowers.** N. Kaur[1], R. Mir[1] and *O. Pandey*[1] *1. School of Physics and Materials Science, Thapar Institute of Engineering and Technology, Patiala, India*

4:18

HG-13. **Ferromagnetism created from 2D heterostructures.** *C. Gong*[1], Y. Wang[1] and X. Zhang[1] *1. University of California, Berkeley, Berkeley, CA, United States*

Session HH

MAGNETORESISTANCE, HALL EFFECT AND RELATED EFFECTS

Hiroaki Sukegawa, Chair
National Institute for Materials Science (NIMS), Tsukuba, Japan

1:30

HH-01. **Efficient magnetization switching by spin-orbit torque in a single layer of perpendicularly magnetized ferromagnetic semiconductor GaMnAs.** *M. Jiang*[1], H. Asahara[1], S. Sato[1], T. Kanaki[1], H. Yamasaki[1], S. Ohya[1,2] and M. Tanaka[1,2] *1. Electrical Engineering and Information Systems, The University of Tokyo, Tokyo, Japan; 2. Center for Spintronics Research Network (CSRN), Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*

1:42

HH-02. **Sign reversal of spin Hall magnetoresistance in Cr-Py bi-layer.** *S. Dutta*[1], A. Bose[1], A.S. Shukla[1] and A. Tulapurkar[1] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

1:54

HH-03. **Magnetotransport Properties in Facing-Target Sputtered Fe_3O_4 Films near Verwey Temperature.** X. Liu[1] and *W. Mi*[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

2:06

HH-04. **Detection of the magnetic proximity effect in perpendicularly magnetised Heusler alloy/Pd bilayers probed with the anomalous Hall effect.** *S. Granville*[1,2], B. Ludbrook[3,2] and T. Butler[1] *1. Robinson Research Institute, Victoria University of Wellington, Lower Hutt, New Zealand; 2. MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand; 3. School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand*

2:18

HH-05. **Origin of the Specific Magnetoresistance in Fe/X (X=Pt, CuO_x, Al_2O_3) Bilayers.** *S. Zheng*[1], K. Meng[1], X. Xu[1], J. Miao[1], J. Chen[1], Y. Wu[1] and Y. Jiang[1] *1. University of Science and Technology Beijing, Beijing, China*

2:30

HH-06. **The magnetic structure evolution, magnetocaloric and giant anomalous Hall effect of $NdMn_2Ge_2$ compound.** *S. Wang*[1], D. Liu[1,2], Y. Hao[3], H. Zhang[2] and Q. Huang[4] *1. Institute of Microstructure and Property of Advanced Materials, Beijing University of Technology, Beijing, China; 2. Key Laboratory of Advanced Functional Materials, Education Ministry of China, Beijing University of Technology, Beijing, China; 3. State Key Laboratory of Surface Physics and Department of Physics, Fudan University, Shanghai, China; 4. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States*

2:42

HH-07. **Magnetic and Electrical Properties of Compensated Ferrimagnet Mn_xGd_yGe Thin Films.** *L. Ren*[1], K. Cai[1], T. Herng[2], Y. Liu[1], J. Ding[2], H. Yang[1] and K. Teo[1] *1. Department of Electrical & Computer Engineering, National University of Singapore, Singapore, Singapore; 2. Department of Materials Science & Engineering, National University of Singapore, Singapore, Singapore*

2:54

HH-08. **Magnetoresistance of Spin-Filter CrVTiAl Films.** *G.M. Stephen*[1], C. Lane[1], G. Buda[1], D. Graf[2], S. Kaprzyk[3,1], B. Barbiellini[4,1], L.H. Lewis[1], A. Bansil[1] and D. Heiman[1] *1. Northeastern University, Boston, MA, United States; 2. National High Magnetic Field Lab, Tallahassee, FL, United States; 3. AGH University of Science and Technology, Krakow, Poland; 4. Lappeenranta University of Technology, Lappeenranta, Finland*

3:06

HH-09. **Anomalous Hall and Nernst effects on Co_2TiSn and $Co_2Ti_{0.6}V_{0.4}Sn$ Heusler thin films.** J. Hu[1,5], B. Ernst[2], *S. Tu*[1,5], M. Kuvezdic[3], A. Hamzic[3,1], E. Tafra[3], M. Basletic[3], Y. Zhang[1], A. Markou[2], C. Felser[2], A. Fert[4,1], W. Zhao[1], J. Ansermet[5] and H. Yu[1] *1. Beihang University, Beijing, China; 2. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 3. University of Zagreb, Zagreb, Croatia; 4. Universite Paris-Saclay, Palaiseau, France; 5. Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*

3:18

HH-10. **Enhancement of the Spin-Orbit Coupling in Silicon by Bismuth Doping.** *F. Rortais*[1], S. Lee[1], R. Ohshima[1], S. Dushenko[1], Y. Ando[1] and M. Shiraishi[1] *1. Kyoto University, Kyoto, Japan*

3:30

HH-11. **Magnetic phase transitions in mesoscopic epitaxial holmium thin films.** *R. Medapalli*[1], H. Ren[1], Y. Xiao[1], S. Sinha[1] and E. Fullerton[1] *1. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States*

3:42

HH-12. **Origins of the unidirectional spin Hall magnetoresistance in metallic bilayers.** *C. Avci*[1,2], J. Mendil[1], G. Beach[2] and P. Gambardella[1] *1. Materials, ETH Zürich, Zürich, Switzerland; 2. Materials Science and Eng., Massachusetts Institute of Technology, Cambridge, MA, United States*

3:54

HH-13. **Element and depth resolved analysis of magnetic moment in $Co_2Fe(Ga_{0.5}Ge_{0.5})$/Ag structure by magnetic circular dichroism-hard x-ray photoelectron spectroscopy.** *J. Jung*[1], Y. Sakuraba[1], T. Sasaki[1], Y. Miura[1], A. Yasui[2], Y. Takagi[2], K.R. Loku Singgappulige[2], T. Nakatani[1] and K. Hono[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. Japan Synchrotron Radiation Research Institute, Sayo, Japan*

4:06

HH-14. **Improvement of band matching by monolayer Ni insertion at the $Co_2FeGa_{0.5}Ge_{0.5}$/Ag interfaces in current-perpendicular-to-plane pseudo spin valves.** *B. Büker*[1,2], J. Jung[2], Y. Sakuraba[2], Y. Miura[2], T. Sasaki[2], A. Hütten[1] and K. Hono[2] *1. Department of Physics, Bielefeld University, Bielefeld, Germany; 2. Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan*

4:18

HH-15. **Heusler Alloy Films with Perpendicular Anisotropy Crystallised Below 100°C.** *W.J. Frost*[1], M. Samiepour[1] and A. Hirohata[1] *1. Department of Electronic Engineering, University of York, York, United Kingdom*

FRIDAY
AFTERNOON
1:30

WASHINGTON 5

Session HI
MOTOR APPLICATIONS
Kais Atallah, Chair
University of Sheffield, Sheffield, United Kingdom

1:30

HI-01. **Fabrication and magnetic shielding properties of Ferro-Aluminum based sandwich composites.** *Q. Zhang*[1] *1. Harbin Institute of Technology, Harbin, China*

1:42

HI-02. **Analysis and Optimization of permanent magnet machines by modular poles.** *Y. Wang*[1], H. Wang[1], W. Liu[1] and Q. Wang[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

1:54

HI-03. **Design and Comparison of High-Flexibility Double-Stator Toroidal-Winding PM Vernier Machine for Wave Energy Generation.** *J. Yu*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong, Hong Kong*

2:06

HI-04. **Design of Winding Configurations for Synchronous Generator with Uncontrolled Rectified Load.** Y. Shi[1], H. Wang[1] and *Y. Wang*[1] *1. Electrical Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China*

2:18

HI-05. **Performance Comparison between Ferrite-ASynRM and Interior PM Machine Drives for Electric Vehicle Applications.** *Y. Hu*[1] *1. Aviation Key Laboratory of Science and Technology on Aero Electromechanical System Integration, Nanjing Engineering Institute of Aircraft Systems, Nanjing, China*

2:30

HI-06. **Comparative Study of the Five-Phase and Three-Phase Permanent Magnet Synchronous Machines Having the Same Stator Laminations.** *Y. Sui*[1], P. Zheng[1] and Z. Yin[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

2:42

HI-07. **Comparative Study of Coreless Stator Concentrated Winding Axial-Flux Permanent Magnet Machine with Different Slot-Pole Combinations.** *C. Wang*[1], W. Geng[1] and Z. Zhang[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

2:54

HI-08. **No-load Iron Loss Analysis of a Radial Flux PMSM with an Amorphous Metal Stator Core.** *W. Tong*[1], S. Wu[1], L. Zhu[1] and J. Jia[1] *1. Shenyang University of Technology, Shen, China*

3:06

HI-09. **Analysis of a New Coupled Phenomenon in Electric Vehicle Charger.** *Y. Xiao*[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong, Hong Kong*

3:18

HI-10. **Proposal of simple wind vibration power generator using magnetostrictive material.** *K. Hasegawa*[1] and T. Ueno[1] *1. Kanazawa University, Kanazawa City, Japan*

3:30

HI-11. **CFD Modelling of Ferromagnetic Micromotors.** *P.D. Inzani*[1], A.D. Gilbert[1], G.R. Tabor[1], S.A. Horsley[1] and F.Y. Ogrin[1] *1. CEMPS, University of Exeter, Exeter, United Kingdom*

3:42

HI-12. **A New Type of Linear Magnetic Spring.** *J. Bird*[1] and H. Baninajar[1] *1. Electrical and Compute Engineering, Portland State University, Portland, OR, United States*

- A -

*Best student presentation award finalist

- B -

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IMPACT FACTOR*

3.046*

The *Journal of Magnetism and Magnetic Materials* proudly presents its new Editor-in-Chief as of 2019: Marcelo Knobel

Marcelo Knobel is the Executive Director of the Brazilian National Nanotechnology Laboratory (LNNano), Brazilian Center for Research in Energy and Materials (CNPEM).

EDITORS

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