



From The President

By Liesl Folks, President of the Magnetics Society

Happy New Year to all of our Members!

Each January in an odd year, we have a transition of the leadership of the Magnetics Society, and I am honored to be assuming the role of President for the coming two-year term (2013 / 2014).



Our outgoing President, Takao Suzuki, Director of the MINT Center at the University of Alabama, deserves the thanks of us all for his outstanding leadership of the Magnetics Society for the past two years. In my view, the signature achievement of his term has been to increase the globalization of our activities across the board, including broader international participation on committees, lectures by our Distinguished Lecturers at new sites around the world, the formation of new Chapters, graduate summer schools held in countries just now

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Joint MMM / INTERMAG 2013 Plenary Session

By Burkard Hillebrands, Honors and Awards Committee Chair

The plenary session of the 2013 joint MMM / INTERMAG Conference took place on January 16, 2013, at the Hyatt Regency Hotel in Chicago, USA. It was the central event of this conference, giving the participants opportunity to gather together to participate in Magnetics Society activities, such as the awards ceremony and the plenary lecture, and to meet at the reception afterwards.

Joint MMM / INTERMAG conferences are co-organized by the American Institute of Physics (AIP) and the IEEE Magnetics Society. The chair of joint conferences alternates

between these two organizations. This year, the Conference Chair was Professor Paul Crowell, representing AIP.

The plenary session was chaired by Prof. Crowell. In his opening address he described the conference and presented statistical data. A total of 2559 abstracts had been submitted, out of which 1749 were accepted, and 70 invited talks were presented. In terms of the number of attendees, the 2013 joint MMM / INTERMAG conference was the largest meeting to date. Attendees originated from 54 countries, with 30% of the attendees from North America, 20% from Europe, 12% from

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developing strong Magnetics activities, new Sister Society Agreements signed with professional organizations in other countries, and so forth. These activities have allowed us to impact members of the magnetics community in many more regions of the world than ever before.

Takao has a great concern for the wellbeing of the Magnetics community, and I wish to personally thank him here for devoting so much energy to the stewardship of the Magnetics Society. The Society is markedly stronger as a result of his tireless efforts, and well positioned for the coming period. I am looking forward to continuing to work with Takao as he takes on the role of Nominations Committee Chair for the current term.

Since the last newsletter there have been a number of changes on the Administrative Committee (AdCom) of the Society, in accord with our bylaws. I wish to thank the outgoing elected members of the AdCom for their valuable inputs to the direction and smooth operations of the Society. They are; Ching-Ray Chang, Bernard Dieny, Sung-Chul Shin, Stuart Parkin and Migaku Takahashi. The outgoing committee chairs deserve special thanks for their hard work and dedication in ensuring that the Magnetics Society's operations have run smoothly and successfully in the 2011 / 2012 term. They are Kaizhong Gao (Technical Committee), Bruce Gurney (Honors and Awards), Peter Fischer (Membership), Chih-Huang Lai (Publicity), Tom Thomson (Finance), Hiroaki Muraoka (Chapters) and Randall Victora (Nominations).

We are also bringing to a close the activities of the Ad-hoc Guiding Principles Committee, lead by Burkard Hillebrands over the past three years, and I wish to extend our grateful thanks to Burkard for leading us through the process of thinking through our longer term objectives so ably. Together this team has accomplished an extraordinary amount in a short term!

I warmly welcome our elected members joining AdCom: Oksana Chubykalo-Fesenko, Nora Dempsey, Pallavi Dhagat (replacement for Burkard Hillebrands), David G. Dorrell, Claudia Felser, Pavel Kabos, Bo Liu, Jan Sykulski and Te-ho Wu (replacement for Laura Heyderman).

I wish to also introduce the new Committee Chairs for the 2013 / 2014 term. We have added one new

committee this year, specifically to oversee the Distinguished Lecturer program. This reflects the importance of this program in our operations. The nominated and approved Chairs are:

Conference Executive Committee - Massimo Pasquale
Technical Committee - S.N. (Prem) Piramanayagam
Honors and Awards Committee - Burkard Hillebrands
Distinguished Lecturer Committee - Sara Majetich
Education Committee - Mingzhong Wu
Membership Committee - Laura Heyderman
Publicity Committee - Erol Girt
Finance Committee - Kaizhong Gao
Chapters Committee - June Lau
Nominations Committee - Takao Suzuki
Publications Committee - Ron Goldfarb
Planning Committee - Bruce Terris

We have kicked off 2013 in fine style with the 12th Joint MMM/INTERMAG Conference, held in the heart of the city of Chicago, Illinois, during 14-18 January. The conference was exceptionally well organized, and my grateful thanks go to the Chair, Paul Crowell, and his team for their work in pulling together the excellent technical program. I was very impressed that they were also able to deliver sunshine for most of the week, which made the location really perfect.

Liesl Folks can be reached via: lfolks@buffalo.edu



Society President Liesl Folks (c) with outgoing President Takao Suzuki (l) & outgoing Ad-hoc Committee Chair Burkard Hillebrands (r) at the joint MMM / INTERMAG 2013 Plenary Session in Chicago.

Michael Mallary Receives 2013 Achievement Award

By Bruce Gurney, Previous Honors and Awards Committee Chair

The IEEE Magnetics Society honors one of its outstanding members each year for his or her lifetime professional achievement. This is the highest award of the Society and is given for scientific, technical achievements and service to the Society. The award is presented at the INTERMAG conference each year, and consists of a diploma with citation and a cash prize.

Dr. Michael Mallary receives the 2013 Achievement Award for “sustained contributions to thin film magnetic recording write head designs; most notably for the invention of the shielded write head structure for perpendicular recording.” He is well known for his contributions to magnetic recording, including modeling and designing various types of writers, including the Diamond inductive head and the shielded pole design used in perpendicular recording.



Dr. Mallary received the S.B. degree in physics from the Massachusetts Institute of Technology, Cambridge, in 1966, and the Ph.D. degree in Experimental High Energy Physic from the California Institute of Technology, in 1971. He was a post doctoral fellow at the Rutherford Laboratory from 1972-1974 and an Assistant Professor of physics at Northeastern University from 1974-1978. There he participated in an experiment at Fermi Laboratory that produced early evidence for the fifth quark using a 300-ton solid iron magnet. From 1978 to 1980 he worked at the Magnetic Corporation of America designing large superconducting magnets. Beginning in the early 1990s he worked for a succession of corporations including Rocky Mountain Magnetics, MKQC, Quantum, Maxtor, and Seagate. Most recently, he joined Western Digital Corporation in 2009 as a Senior Technologist working on advanced recording technologies.

In 1980 Dr. Mallary joined the Digital Equipment Corporation's effort to produce thin film heads for disk drive recording as a head modeler and designer. Here he invented the shielded pole perpendicular recording head which has demonstrated superior performance over the conventional monopole head and is presently used in all disk drives. He also invented the Diamond inductive head (>40M shipped) which

doubles the effective number of turns and he contributed to the theory of flux conduction in thin film heads. In the late 1990s he anticipated the gradual reduction of the bit aspect ratio of magnetic bits, showing the SNR advantage of a low bit aspect ratio.

In 2007 Dr. Mallary became an IEEE Fellow “for contributions to magnetic recording devices” and in 2009 he served the magnetics community as a Magnetics Society Distinguished Lecturer, presenting review of advances in magnetic recording entitled “The Evolution and Revolutions in Disk Drive Recording”. He has served at INTERMAG and MMM conferences on program committees over three decades. He is listed as an inventor on 92 issued U.S. patents, 48 foreign patents and is an author of 52 publications. He authored a book on cosmology and evolution entitled “Our

Improbable Universe” in 2004 and wrote the Recording Head Design chapter of “The Physics of Ultra High Density Magnetic Recording”, published in 2001.

Dr. Mallary joins a distinguished list of past recipients: Fred Luborsky 1981, Herb Storm 1982, Harold Lord 1984, Joe Suozzi 1985, Fritz Friedlaender 1986, Andrew Bobeck 1987, Floyd Humphrey 1988, Paul Biringier 1989, Daniel Gordon 1990, Emerson Pugh 1991, Yoshifumi Sakurai 1992, William Doyle 1993, Richard Barker 1994, Mark Kryder 1995, Koosuke Harada 1996, Gordon Slemmon 1997, Stan Charap 1998, Dave Thompson 1999, Denis Mee 2000, Fred Hagedorn 2001, Sun-ichi Iwasaki 2002, Carl Patton 2003, Yutaka Sugita 2004, Robert Fontana 2005, Neal Bertram 2006, John C. Mallinson 2007, Jack H. Judy 2008, Roger Wood 2009, Isaak Mayergyoz 2010, Jian-Gang (Jimmy) Zhu 2011 and John Slonczewski 2012.

Get in touch...

We're always interested to hear from Newsletter readers... what you like, what you don't like - what you'd like to see more of in the Newsletter. Just letting us know that you're a reader would be great too!

Drop the Editor a line at: g.p.hatch@ieee.org

New IEEE Fellows

By Burkard Hillebrands, Honors and Awards Committee Chair

Five members of the Magnetics Society have been elevated to IEEE Fellow for 2013:

- **Jeffrey Childress**, for contributions to nanostructured materials and their applications in magnetic recording (HGST);
- **Dan Ionel**, for contributions to the analysis, design and manufacturing of high efficiency electric machines (Regal Beloit Corporation);
- **Kannan Krishnan**, for contributions to nano-magnetic technology in medicine (University of Washington);
- **David Larbalestier**, for contributions to development of superconducting materials leading to high field magnetics (Florida State University); and
- **Caroline Ross**, for contributions to synthesis and characterization of nanoscale structures and films for magnetic and magneto-optical devices (MIT).



From left to right: Jeffrey Childress, Dan Ionel, Kannan Krishnan David Larbalestier and Caroline Ross

Italy Chapter News

By Ermanno Cardelli, Italy Chapter Chair

During a special session of the Joint European Magnetic Symposia (JEMS) conference in Parma, Italy, in September 2012, The Italian Chapter of the IEEE Magnetics Society hosted 2012 Distinguished Lecturer Prof. Masahiro Yamaguchi, for a presentation titled "Soft Magnetic Thin Film Applications at Radio Frequencies."

More than 120 people attended the event.



2013 Distinguished Lecturers

The IEEE Magnetics Society selected four Distinguished Lecturers (DLs) for 2013. They are:

- ▶ Michael McHenry (Carnegie Mellon University, USA);
- ▶ Adekunle Adeyeye (National University of Singapore, Singapore);

- ▶ Rudolf Schaefer (IFW Dresden, Germany);
- ▶ Koki Takanashi (Tohoku University, Japan).

Each DL makes his own schedule, so contact them early, via the email addresses in the following profiles. *continued on page 5*

Nanocomposite Magnets for Energy Applications

Michael McHenry, Department of Materials Science and Engineering,
Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

Recent U.S. Department of Energy workshops highlight the need for advanced soft magnetic materials leveraged in novel designs of power electronic components and systems for power conditioning and grid integration. Similarly, soft magnetic materials figure prominently in applications in electric vehicles and high torque motors. Dramatic weight and size reductions are possible in such applications. Nanocomposites also hold potential for applications in active magnetocaloric cooling of such devices. Bulk and thin film soft magnet sensors can contribute to the search for oil and critical materials. In opportunities for state-of-the-art soft magnetic to impact such applications have been furthered by investment by U.S. Department of Defense programs and other world-wide efforts to advance these materials for applications in military electric vehicle technologies.

This talk will focus on the framework for developing high frequency magnetic materials for grid integration of renewable

energy sources bridging the gap between materials development, component design, and system analysis. Examples from recent efforts to develop magnetic technology for lightweight, solid-state, medium voltage (13 kV) energy conversion for megawatt-scale power applications will be illustrated. The potential for materials in other energy applications (motors, cooling, sensors, RF metal joining, etc.) will also be introduced. The scientific framework for nanocomposite magnetic materials that make high frequency components possible will be discussed in terms of the materials paradigm of synthesis structure properties performance. In particular, novel processing and the control of phase transformations and ultimately nanostructures has relied on the ability to probe structures on a nanoscale. Examples of nanostructural control of soft magnetic properties will be illustrated.

Michael McHenry received the B.S. degree in metallurgical engineering and materials science from Case Western Reserve University, in 1980, and the Ph.D. degree in materials science and engineering from the Massachusetts Institute of Technology, in 1988.

From 1980 to 1983, he was employed as a Process Engineer at the U.S. Steel Lorain Works. He was a Director's Funded Postdoctoral Fellow at Los Alamos Lab, from 1988 to 1989. Currently, he is a Professor of materials science and engineering, with an appointment in physics, at Carnegie Mellon University, Pittsburgh, PA. He has expertise in the area of nanocrystalline magnetic materials including soft magnetic nanocomposites, faceted ferrite nanoparticles and materials for power conversion, biomedical, energy and data storage applications. His research involves rapid solidification processing, plasma and solution synthesis of nanoparticles, magnetic field of processing materials, structural characterization by x-rays and electron microscopy and magnetic properties characterization as a function of field, temperature and frequency. He directed a Multidisciplinary University Research Initiative (MURI) on high temperature

magnetic materials for aircraft power applications and currently leads an ARPA-E program in magnetic materials for power electronics. He has published over 250 papers and owns two patents in the field. He has co-authored *Structure of Materials* (Cambridge University Press, 2007, 2012).



Dr. McHenry has served as Editor, Publication Chair and as a member of the Program Committee for the Magnetism and Magnetic Materials (MMM) and Intermag Conferences.

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Artificial Ferromagnetic Nanostructures: An Experimental Platform for Magnonics

Adekunle Adeyeye, Department of Electrical & Computer Engineering,
National University of Singapore, Singapore

Artificial ferromagnetic nanostructures with periodic lateral contrasts in magnetization are known as “magnonic crystals” (MCs), conceived as the magnetic analogue of photonic crystals. Recently, there is growing interest in the fundamental understanding of the spin wave propagation in MCs because of their huge potential in a wide range of applications such as microwave resonators, filters and spin wave logic devices. With advances in controlled nanofabrication techniques, it is now possible to synthesize high-quality periodic bi-component magnetic nanostructures with precisely controlled dimensions. The band spectrum of MCs consists of allowed states magnonic bands and forbidden states (magnonic gaps) that can be tuned by magnetic fields or geometrical parameters. We have shown that MCs represent a perfect system for studying excitations on disordered periodical lattices because of the possibility of controlled variation in the degree of disorder by varying the applied magnetic field [1], we have also demonstrated functionality of magnetic logic based on a reconfigurable MC in the form of a meander-type ferromagnetic nanowire [2]. A ferromagnetic resonance method employing a microscopic coplanar waveguide was used to detect the logic state of the structure coded in its magnetic ground state.

This talk will be divided into three parts: the first part will focus on strategies we have developed for synthesizing high-quality one-dimensional and two-dimensional MCs using a deep ultraviolet lithography technique at 248 nm exposure wavelength. Using resolution enhancement techniques, we have fabricated arrays of ferromagnetic nanostructures with lateral dimensions and interelement spacing below the conventional resolution limit of optical lithography tools. The second part will focus on results of our recent systematic investigation of both the static and dynamic properties of MCs using a combination of magneto-optical Kerr effect measurements, magnetic force microscopy, broadband ferromagnetic resonance spectroscopy, magneto-transport measurements and micromagnetic simulations. In the third part, the concept of binary magnetic nanostructures will be introduced and their potential application in magnetic logic devices demonstrated.

[1] J. Ding, M. Kostylev, and A. O. Adeyeye, *Phys. Rev. Lett.*, vol. 107, p. 047205, 2011.

[2] J. Ding, M. Kostylev, and A. O. Adeyeye, *Appl. Phys. Rev. Lett.*, vol. 100, p. 062401, 2012.

Adekunle Adeyeye (SM'01) received the B.Sc. degree in physics from the University of Ilorin, Nigeria, in 1990, and the MPhil, in microelectronic engineering and semiconductor physics, and Ph.D. degrees from the University of Cambridge, U.K., in 1993 and 1996, respectively.

Prof. Adeyeye was elected a Junior Research Fellow at Trinity College, University of Cambridge, in 1996. He then worked as a Senior Research Engineer at the Data Storage Institute, Singapore, in 1997, before returning to Cambridge to take up his fellowship at the Nanoscale Science Laboratory. He joined the Department of Electrical and Computer Engineering, National University of Singapore, as an Assistant Professor in 2000. He was promoted to Associate Professor with tenure in 2006 and Full Professor in July 2012. He has published more than 250 technical articles in peer-reviewed journals, including

book chapters, review articles, and invited topical review in the areas of nanomagnetism.

Prof. Adeyeye is a Fellow of the Institute of Physics and Fellow of the Institute of Nanotechnology.



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Magneto-Optic Analysis of Magnetic Microstructures

Rudolf Schaefer, Leibniz Institute for Solid State and Materials Research (IFW),
Dresden, Germany

The rich world of magnetic microstructure or magnetic domains, extending from visible dimensions down to the nano-scale, forms the mesoscopic link between the fundamental physical properties of a magnetic material and its macroscopic properties and technical applications, which range from films for computer storage technology to magnetic cores for electrical machinery. Hysteresis phenomena, energy loss in inductive devices, noise in sensors, or the magnetoresistive properties of modern spintronic devices can be decisively determined by the peculiarities of the underlying magnetic microstructure, especially by irreversibilities in the magnetization process. Therefore, any development and optimization of magnetic materials, which is usually accompanied by the measurement of magnetization curves, requires an understanding of the underlying domains and their reaction to magnetic fields, which, in most cases, can only be gained by direct imaging.

The presentation will address different aspects of magnetic microstructure adapted, where possible, to the interest of the audience and supported by domain observation using Kerr microscopy. This may include domains and magnetization processes in bulk magnetic material like oriented and nonoriented electrical steel, amorphous and nanocrystalline ribbons or permanent magnets, as well as thin films and multilayers. Fast magnetization processes can also be considered. Most challenging is the analysis of hidden (internal) domains and processes in bulk material. They are relevant for material performance and their analysis requires surface imaging in combination with domain modeling and some volume-sensitive imaging method. Aside from their scientific and technical relevance, magnetic microstructures are also aesthetically appealing, an aspect that will be part of the presentation.

Rudolf Schaefer received the diploma degree in materials science and the Ph.D. degree in engineering from the University of Erlangen-Nuernberg, Germany, in 1985 and 1990, respectively.

He then joined the IBM Research Center in Yorktown Heights, USA, and the Forschungszentrum Juelich, Germany, as a Postdoctoral Researcher in 1991 and 1992, respectively. In 1993 he moved to the IFW Dresden (now the Leibniz Institute for Solid State and Materials Research, Dresden, Germany), where he became head of the Department of Magnetic Microstructures in 2002. In 2011, he was appointed Honorary Professor for magnetic materials at the Institute for Materials Science, Technical University Dresden. His areas of interest span magnetic materials with a focus on magnetic microstructures and domain imaging by Kerr microscopy. He has published more than 130 technical articles in peer-reviewed

journals, including book chapters, and he has coauthored the textbook *Magnetic Domains*.

Prof. Schaefer currently is on the Technical Committee of the IEEE Magnetics Society representing the field of magnetic imaging.



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IEEE Magnetics Society 2013 Distinguished Lecturer

Advanced Spintronic Materials for Generation and Control of Spin Current

Koki Takanashi, Institute for Materials Research (IMR), Tohoku University, Sendai, Japan

“Spin current,” i.e., the flow of spin angular momentum, in magnetic nanostructures has emerged as a fascinating physical concept during the recent development of spintronics. In magnetic nanostructures, magnetism correlates strongly with electronic transport and also other physical properties, leading to the mutual control of magnetic, transport, and other physical properties. The efficient generation and precise control of spin current in magnetic nanostructures are key technologies for the further development of spintronics [1]. There are two kinds of spin current: one is accompanied by an electric current, and the other is *not*. Spin current *without* an electric current is called *pure* spin current, which is actually generated by several experimental methods such as nonlocal spin injection, spin Hall effect, spin pumping, spin Seebeck effect, and so on. In recent years spin current has been extensively investigated, and

particularly the understanding of *pure* spin current has dramatically developed.

In this lecture the concept, historical background, and recent progress in research of spin current will be reviewed, and then some topics on advanced materials for the generation and control of spin current will be introduced, with a focus on magnetic ordered alloys: half-metallic Heusler alloys as a highly efficient spin injector/detector and L1a-ordered alloys with high magnetic anisotropy as a perpendicularly polarized spin injector/detector.

[1] K. Takanashi, *Jpn. J. Appl. Phys.*, vol. 49, p. 110001, 2010.

Koki Takanashi received the B.S., M.S., and Ph.D. degrees in physics from the University of Tokyo, Japan.

After postdoctoral research at Tohoku University, he joined the faculty there and is now a Professor and Deputy Director of the Institute for Materials Research at Tohoku University, Sendai, Japan. In 1994 and 1995 he was an Alexander von Humboldt Research Fellow at the Forschungszentrum Jülich, Germany. He has published over 300 papers and was the leader of a national project in Japan: “Creation and Control of Spin Current” (2007–2011). His research interests include magnetism and magneto-transport in nanostructures, magnetic materials for spintronics, and spin current phenomena.

Prof. Takanashi has received numerous awards, including the Outstanding Research Award (2004, Magnetics Society of

Japan), Outstanding Paper Award (2009, Japan Society of Applied Physics), and Masumoto Hakaru Award (2011, Japan Institute of Metals).



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Japan, and 10% from China, underlining the fact that the joint MMM / INTERMAG Conference is a truly international event.

Prof. Crowell took the opportunity to thank the many volunteers that made the Conference such a success. The audience joined him in recognizing the program chairs Ilya Krivorotov, Werner Scholz, and Shinji Yuasa, the treasurer Yumi Ijiri, the publication chairs Hari Srikanth and Oliver Gutfleisch, and their editors Alina Deac, Cindi Dennis, David Dorrell, Victorino Franco, Laura Heyderman, Min-Fu Hsieh, Ron Jansen, Ganping Ju, Johannes Paulides, S. N. Piramanayagam, Ciro Visone, Dan Wei and Jong-Ching Wu, the IEEE Transactions on Magnetics conference editor Laura Lewis, the Journal of Applied Physics editor James Viccaro, the exhibits chair Mingzhong Wu, the publicity chair Brian Maranville, the student travel chairs Beth Stadler and Matt Carey, the student awards chair Anand Bhattacharya, and the conference management Diane Melton and Anne LoPresti.

A special thanks was given to Janis Bennett, who was retiring after more than 30 years of service to the Annual Conference on Magnetism and Magnetic Materials, organized by the AIP.

Before the presentation of awards began, the Honors and Awards Committee Chair Burkard Hillebrands recognized the life and work of Fritz Friedlaender, who passed away last October. He recalled the many ways Fritz had contributed to the Magnetics Society both in science and with service. Prof. Friedlaender was one of the founding members of our Society, and he served as President in 1977 and 1978. Among his many honors and awards he has received were Fellow of IEEE and of the American Physical Society, the IEEE Centennial Medal, the IEEE Magnetics Society Achievement Award, the IEEE Third Millennium Medal, and an honorary doctorate from the Ruhr Universität Bochum in Germany. Prof. Friedlaender was an IEEE Magnetics Society Distinguished Lecturer, and he was a honorary member of the Magnetics Society of Japan.

The IEEE Magnetics Society Achievement Award is awarded every year to a Magnetics Society member who has made extraordinary contributions to the field of magnetics, both through technical achievements and through service to the Magnetics Society. Previous recipients have included such distinguished scientists, engineers and managers as Floyd Humphry, Emerson Pugh, Bill Doyle, H. Neal Bertram, Isaak

Mayergoyz, and, last year, John Slonczewski. This award is the highest honor bestowed by the Magnetics Society. This year the recipient was Dr. Michael Mallary, for "sustained contributions to thin film magnetic recording write head designs; most notably for the invention of the shielded write head structure for perpendicular recording." The award, consisting of a certificate and a cash award, was presented by Magnetics Society President Liesl Folks. She addressed the enormous contribution Dr. Mallary has made in inventing the modern write head design, in particular the development of the shielded pole design for perpendicular magnetic recording.

Five members of the Magnetics Society have been elevated to the grade of IEEE Fellow. They were presented next. The IEEE Grade of Fellow is conferred by the Board of Directors of the IEEE upon a person with an extraordinary record of accomplishments in any of the IEEE fields of interest. The total number selected in any one year does not exceed one-tenth of one percent of the total voting Institute membership. The new Fellows are Jeffrey Childress, Dan Ionel, Kannan Krishnan, David Larbalestier and Caroline Ross.

Next, the Honors and Awards Chair thanked the 2012 Distinguished Lecturers for their work. They were George Hadjipanayis, Gerrit Bauer, Masahiro Yamaguchi, and Shinji Yuasa. They were selected because of their high level of expertise in topics of interest to the magnetism community and because of their excellence in public speaking. They went to countries such as South Africa, Iceland, Turkey, Chile, Portugal, Vietnam, Brazil, Argentina, Thailand, and several new cities in India and China, and many places more. The new 2013 Distinguished Lecturers were introduced: Adekunle Adeyeye, Michael McHenry, Rudolf Schaefer, and Koki Takanashi.

Paul Crowell, Chair of this joint MMM/INTERMAG Conference thanked Jan-Ulrich Thiele, chair of the 2012 INTERMAG conference, for organizing an exciting and very successful conference in Vancouver.

It is a good tradition to thank those members of the Society's Administrative Committee (AdCom) who are rotating off. They were called to the stage, where they were presented with Certificates of Appreciation. They were Ching-Ray Chang, Bernard Dieny, Sung-Chul Chin, Stuart Parkin, Migaku Takanashi, and Manuel Vázquez. The Honors and Awards Chair also thanked the outgoing committee chairs and

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MMM / INTERMAG 2013 Plenary Session

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presented them with Certificates of Appreciation. AdCom chairs oversee the ongoing activities of the Society, including functions to keep the Society running smoothly. They are appointed by the President. This year's outgoing chairs were Peter Fischer (Membership Committee), Kaizhong Gao (Technical Committee), Bruce Gurney (Honors and Awards Committee), Vincent Harris (Distinguished Lecturer Coordinator), Burkard Hillebrands (Ad-hoc Committee on Guiding Principles), Chih-Huang Lai (Publicity Committee), Hiroaki Muraoka (Chapters), Tom Thomson (Finance Committee) and Randall Victora (Nominations Committee).

Each year the Magnetics Society sponsors a summer workshop for students, where some 50 students attend a three-day workshop given by some of the best scientists working in magnetism. This program is run by the Education Committee, and Education Committee Chair Mingzhong Wu presented a Certificate of Appreciation to thank the Chair of the Student Workshop in 2012, Shivaraman Ramaswamy. He very successfully organized the school 2012 in Chennai, India.

Next, the Conference Chair of the Best Student Presentation Award, Dr Anand Bhattacharya introduced the 2013 Best Student Presentation Award Finalists. Five finalists were selected, following the submission of abstracts to the conference and review of their applications, based on the likely quality and

impact of their work. They were Azure D. Avery (University of Denver), Uwe Bauer (MIT), Hiroshi Idzuchi (University of Tokyo), Xue Lin (Cornell University) and Elizabeth Rapoport (MIT).

As part of its commitment to keeping the field of magnetics vibrant, the Magnetics Society provides travel grants for students to attend Magnetics Society sponsored conferences. Generally, these are students in doctoral or masters programs within a year or so of graduating. Their vitality and enthusiasm brings a fresh perspective to the conference, and the students have a chance to learn more about how conferences and publications feature into being a professional scientist or engineer.

The highlight of each Plenary Session is the Plenary Lecture. Professor Roland Wiesendanger from the University of Hamburg in Germany gave a very inspiring lecture on "Atomically Tailored Nanomagnets and Their Use for Atomic-Level Spintronics." Using spin-dependent tunneling microscopy and spectroscopy tools developed in his laboratory, he demonstrated single atom magnetometry and showed fascinating insight into novel concepts of magnetic logic on an atomic level, as well as into two-dimensional nano-skyrmion lattices of single atomic layers of some epitaxially grown transition metals.

MMM / INTERMAG 2013 Student Travel Grant Reports

Submitted by Burkard Hillebrands, Honors and Awards Committee Chair

Each recipient of a student travel grant aware from the Society is asked to write a brief summary of their conference experience. The following are extracts from the summaries written after the 2013 joint MMM / INTERMAG Conference in Chicago.

* * *

"Thank you so much for hosting such a wonderful conference and the encounter of many brilliant minds during the conference is something that I will never forget."

-- Lei Lu (Colorado State University)

"This conference provided me an important opportunity to meet the great experts and learn the latest information in the areas of magnetism. I also used this conference to present my

research works to other researches. The feedbacks are very helpful to improve our research."

-- Ding Junjia (National University of Singapore)

"It was a great experience to attend the conference where I presented my research work and met experts of both academic and industry from all over the world, which definitely updated my knowledge and extended network of career."

-- Hao Su (University of Alabama)

"It was a fantastic experience to attend the Joint MMM/Intermag conference. I used this opportunity to present my PhD work in the magnetic community. Hopefully, we can meet up again at other MMM or INTERMAG conferences again!"

-- Jessada Chureemart (University of York)

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“Since this conference is the last time in my Ph.D. program, I broadened my scope with a varied session for finding postdoctoral position, and had a valuable interview. I wish the INTERMAG conference continued development and meaningful support for graduate students in the years ahead.”

-- *Jungbum Yoon (Inha University)*

“Beyond my own presentation, I enjoyed the breadth of topics and sessions offered at the conference. It was great to see not only how my own work fit into the ‘big picture’, but also to see the latest developments and progress in a variety of fields different from my own.”

-- *Melissa Loving (Northeastern University)*

“It was exciting to meet so many people, who come from different countries, speak different languages but who do the same research work. You may get the chance to have discussion with authors whose names appear in your references. You could get inspiration from the other colleagues' reports. Probably you can plan your career after the talk with experts.”

-- *Sasha Bi (University of Erlangen)*

“The Conference provided me a great opportunity not only to present my recent work but also to communicate with other researchers from all over the world. I am very glad that both my talk and poster attracted much interest. The questions and comments from the audience are very helpful and insightful.”

-- *Hao Wu (Arizona State University)*

“The ‘happy hour with the experts’ gave me a better idea on how to navigate my career and the possibilities for a researcher with my background. Besides, the conference gave me a deeper

insight to other magnetism-related research topics and the state of the art in these topics, which tickles my scientific curiosity.”

-- *Kevin Pluk (Eindhoven University of Technology)*

“The conference was very useful for students like me working in the research field of magnetism. I got a clear overview of the present goal of scientific research in magnetism, its prospects and their social and industrial requirements.”

-- *Tuhin Maity (University College Cork)*

“I am grateful that I could have the chance to become acquainted with other students, professors and experts from both academic and industry. It is pleasant to talk with people who work in the same field and build new friendship. We have discussed a wide range of topics from work-life balance to career development. This is beneficial to expanding my professional network.”

-- *Weiyang Li (Oregon State University)*

“It was my first time to attend an international conference, which has deeply impressed me. It is really a big family with so many hard workers and scientists. I have recognized that the magnetism is full of our life. In the conference, the reports were so amazing with profound discussion.”

-- *Xuegang Chen (Peking University)*

“My oral presentation received a very positive response from the experts. The questions and comments I received from the audience provided me with alternative directions for my research. I had a wonderful time at the conference and Chicago was a great backdrop.”

-- *Vishal Panchal (NPL/RHUL)*

MMM / INTERMAG 2013 Best Student Presentations

By Burkard Hillebrands, Honors and Awards Committee Chair



The selection of the winner of the Best Student Presentation Award was made at the joint MMM/INTERMAG 2013 conference in Chicago. All presentations were excellent, and the finalists contributed papers of great interest to the conference attendees. Congratulations to the finalists and the winner!

Winner: Uwe Bauer (MIT)

Title: Electrical Control of Domain Wall Motion in Perpendicular Magnetic Anisotropy Materials (BF-01)

Finalist: Azure D. Avery (University of Denver)

Title: Observation of the planar Nernst effect in ferromagnetic thin films with in-plane thermal gradients (AD-04)

Finalist: Hiroshi Idzuchi (University of Tokyo)

Title: Effect of spin absorption on precession dynamics of pure spin currents in lateral spin valves (ED-09)

Finalist: Xue Lin (Cornell University)

Title: X-ray imaging of magnetic normal modes driven by spin transfer torque in magnetic nanopillar devices (AF-13)

Finalist: Elizabeth Rapoport (MIT)

Title: Dynamics of magnetic domain wall mediated superparamagnetic microbeads transport (FH-02)

Election Results

By Randall Victora, Previous Nominations Committee Chair

Each year, the Magnetics Society holds an election for 8 three-year terms on AdCom. In 2012, the Nominations Committee consisted of Bernard Dieny, Laura Lewis, Hiroaki Muraoka, Mi-Ching Tsai, Ron Goldfarb, Dmitri Litvinov, Jan-Ulrich Thiele, Takao Suzuki (ex-officio) and Randall Victora (chair).

Nominations were solicited from all members of the Magnetics Society. The election extended from August 23 – October 4. 594 ballots representing 20.4% of society members were received. This was 2% better participation than in the previous year.

The members elected for 2013-2015 were:

- Oksana Chubykalo-Fesenko
- Nora Dempsey
- David Dorrell
- Claudia Felser (2nd term)
- Burkard Hillebrands
- Pavel Kabos
- Bo Liu
- Jan Sykulski

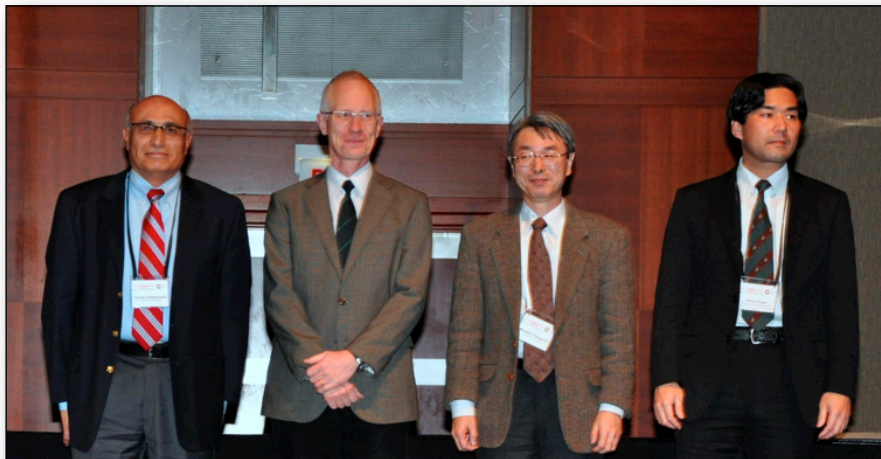
Also, AdCom members elected Manuel Vázquez to be the 2013-2014 Treasurer. As is customary, the current Treasurer Bruce Terris was selected to succeed to President-Elect.

MMM / INTERMAG 2013 Plenary Session: In Pictures

Submitted by Burkhard Hillebrands, Honors and Awards Committee Chair



Paul Crowell, the Conference Chair, giving his opening address.



2012 Magnetics Society Distinguished Lecturers (left to right): George Hadjipanayis, Gerrit Bauer, Masahiro Yamaguchi and Shinji Yuasa.



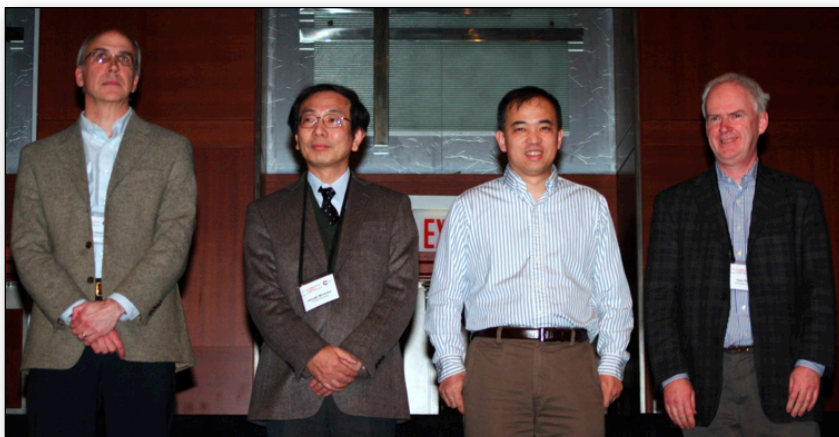
Four of the five new IEEE Fellows: Jeffrey Childress, David Larbalestier, Caroline Ross and Kannan Krishnan (left to right).



Michael Mallery receives the 2013 Magnetics Society Achievement Award from Society President Liesl Folks.



Roland Wiesendanger, delivering the Plenary Lecture.



Retiring AdCom Committee Chairs (left to right): Randall Victora (Nominations), Hiroaki Muraoka (Chapters), Kaizhong Gao (Technical) and Thomas Thomson (Finance).

New Senior Members

The following members of the IEEE Magnetics Society were recently elevated to the grade of Senior Member.

Oct 2012: Stephane Mangin and Jorge Pleite.

Dec 2012: Giovanni Finocchio, Anton Geiler, Jason Goldberg, Arash Hassanpour Isfahani, Xiaochuan Jia, Romney Katti, Sheldon Kennedy,

Byung-il Kwon, Garrett McCormick, Kiyoshi Miyashita, Akimitsu Morisako, Janne Nerg, Masahide Ohshima, Ruilin Pei, Pavol Rafajdus, Chris Rea and Thomas Silva.

For further information, visit the IEEE Web site at:

http://www.ieee.org/membership_services/membership/grade_elevation.html

Intro Course on Magnetic Random Access Memory

By Bernard Dieny

This introductory course will be held at MINATEC in Grenoble, France during 1-3 July 2013. It is aimed at helping students, researchers and engineers having little or no background in magnetism to better understand the physics and working principles of a new class of magnetic memory called magnetic random access memory (MRAM), based on magnetic tunnel junctions.

These MRAM or spin-transfer-torque random access memory (STTRAMs) are attracting an increasing interest in microelectronics industry. In the recent International Roadmap on Semiconductors report, they have been identified alongside redox RAM as one of the two most promising technologies of emerging non-volatile memory allowing scalability to and beyond the 16 nm technology node.

The courses will be organized during two and a half days. It will cover various aspects of MRAM technology: the basic spintronics phenomena involved in MRAM, the materials, the various categories of MRAM (pros/cons, performances, degree

of maturity), the fabrication process, and the perspectives of low power electronic circuits based on this hybrid CMOS/magnetic technology. The course will be completed by an optional half day of presentation of design tools for the design of hybrid CMOS/MRAM circuits and of lab visit.

The conference language will be English. More information and registration details can be found at www.inmram.com.



Old Newsletter Issues Wanted

We are in the process of scanning and archiving old hard copies of the Newsletter from the years before it was available in electronic form. We are missing a number of the issues published between 1989 and 1999, and almost all of the issues prior to this period. Do you have copies of these issues, perhaps gathering dust somewhere on a shelf? If so, we would really like to hear from you. We are

specifically looking for the following issues (listed as volume-issue pairs): 35-4, 34-4, 34-3, 34-2, 33-4, 33-3, 32-3, 31-1, 28-4, 27-4, 27-1, 26-3, 26-1 and all issues prior to that with the exception of 23-4.

If you can help, please email the Newsletter Editor at g.p.hatch@ieee.org today - thanks!

Conference Calendar

Apr 8-12, 2013 Latin American Workshop on Magnetism, Magnetic Materials & Applications
Buenos Aires, Argentina
Web site: law3m.fisica.org.ar

May 19-24, 2013 The 8th International Symposium on Metallic Multilayers
Kyoto, Japan
Web site: www.mml2013.jp

Jun 30 - Jul 4, 2013 Compumag 2013
Budapest, Hungary
Web site: www.compumag2013.com

Aug 20-22, 2013 The Magnetic Recording Conference TMRC 2013
Tokyo, Japan
Web site: www.tmrc2013.riec.tohoku.ac.jp

Sep 13-17, 2013 3rd International Conference on Materials and Applications for Sensors and Transducers IC-MAST 2013
Prague, Czech Republic
Web site: www.icmast.net

Nov 3-8, 2013 58th Conference on Magnetism & Magnetic Materials MMM 2013
Denver, CO, USA
Web site: www.magnetism.org

Dec 3-5, 2013 7th International Conference on Sensing Technology ICST 2013
Wellington, New Zealand
Web site: seat.massey.ac.nz/conferences/icst2013/

To list your conference in the Newsletter Conference Calendar, please contact the Editor

About The Newsletter

The purpose of the IEEE Magnetics Society Newsletter is to publicize activities, conferences, workshops and other information of interest to the Society's members and other technical people in the general area of applied magnetics. Manuscripts are solicited from Magnetics Society members, conference organizers, Society Officers & other volunteers, local chapters, and other individuals with relevant material.

The Newsletter is published in January, April, July and October electronically on the Magnetics Society webpage at www.ieeemagnetics.org. Submission deadlines are January 1, April 1, July 1, and October 1 respectively.

Please send articles, letters & other contributions to the Newsletter Editor:

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