

From the President

By Manuel Vázquez, President of the Magnetics Society

The INTERMAG Conference, the flagship event of the Magnetics Society, was held in Dublin, Ireland, during 24-28 April 2017. It was a major event with excellent participation from attendees, both in quality and quantity. I would like to once again congratulate Nora Dempsey, Conference Chair, and the whole team of organizers for their great job. I would like to mention, among others, Mike Coey, Local Chair; Adekunle Adeyeye, Cindi Dennis and Jeffrey McCord, Program co-Chairs; Prem Piramanayagam and Petru Andrei, Publication co-Chairs; Karsten Rode and Mark Kief, Treasurers; Rudi Schäfer, Magnetics Society representative; and the invaluable involvement of Diane Melton and Regina Mohr. You can find further details of the scientific and Plenary sessions, and pictures from the Reception, in the reports elsewhere in this edition of this Newsletter, by Nora Dempsey and Burkard



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2017 IEEE Magnetics Society Summer School

By José Manuel (Manu) Barandiaran, Local Organizing Committee Chair

The 2017 IEEE Magnetics Society Summer School took place during 19-23 June, 2017, in Santander, Spain. It was organized by the Basque Center for Materials, Applications and Nanostructures (BCMaterials), part of the University of the Basque Country (UPV/EHU Bilbao), together with the Department of Science and Engineering of Materials (CITIMAC) of the University of Cantabria (UC), and with the collaboration of the International University Menéndez Pelayo (UIMP). The support of the Spanish Club of Magnetism (sister Society to IEEE Magnetics Society) and the Chapters of the Magnetic Society of the IEEE in Spain, Italy and Romania was also decisive.

The School took place in the Magdalena Palace in Santander, and was attended by 90 PhD students from 22 countries. The chairs of the local Organizing Committee were José Manuel Barandiaran (Scientific Director of BCMaterials) and José Carlos Gómez Sal (UC). Manuel Vázquez, President of the IEEE Magnetics Society and Atsufumi Hirohata, Education Committee Chair, were present during the School.

The lectures took place in the Paraninfo of the UIMP, located in the historical stables. Catering and posters exhibit were co-located with the lectures, promoting significant contact between

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Hillebrands. It was an unforgettable experience thanks to the appeal of Dublin and the Dubliners.

While writing this report, the decision on the location of the next INTERMAG Conference in Europe (to be held in 2021), was under discussion by the Conference Executive Committee. Three outstanding candidates have been presented: Manchester, England by Tom Thomson, Lyon, France by Bernard Dieny, and Athens, Greece by Dimitris Niarchos. We will know pretty soon what the final choice will be.

I had the opportunity to join the successful IEEE Magnetics Society Summer School, held at the Universidad Internacional Menéndez Pelayo (UIMP) in Santander, Spain 19-23 June, 2017, chaired by Manu Barandiaran and José Carlos Gomez Sal, under the coordination of Atsufumi Hirohata, Education Chair. The event took place in the incomparable setting of the Magdalena Palace, with views over the Bay of Santander. The excellence of the lecturers and their lectures, along with further details are summarized in Manu's report elsewhere in this edition of the Newsletter. Here, I would like to emphasize the success of the new initiative to support student-led projects, through grants to two teams of five members each, with \$5k. It was impressive to see the interest of students in meetings and discussion, and to propose really novel ideas. It is my feeling that this first initiative was very useful to foster real scientific

interactions among young scientists. I hope the two winning teams will in addition be successful in developing their proposed ventures, and eventually to report on them at the next INTERMAG meeting in Singapore, in 2018.

The publication of scientific and technological outcomes is probably the most important activity in achieving broader visibility of our results. I would like to encourage you to submit your best results to the journals of our Magnetics Society. *IEEE Transactions on Magnetics*, edited by Pavel Kabos, is our well-established (1965) and well-acknowledged journal on magnetic matters, suitable for long papers; while *IEEE Magnetics Letters*, edited by Ron Goldfarb, has an impressive record for prompt publication of outstanding shorter reports. You can visit the corresponding links via the Society's web site.

I should finish my report with a kind reminder, and a wish. Please join and encourage close colleagues to become members of the Magnetics Society, and promote activities at your local Chapter. Your contribution is not only a service to our non-profit association, but you will be rewarded with a refreshing experience of interaction with colleagues in magnetism. Please, contact me with your new ideas or concerns.

Manuel Vázquez can be reached via manuel.v.vazquez@ieee.org.

Journal on Exploratory Solid-State Computational Devices and Circuits (JXCDC)

By Ian Young, Editor-in-Chief, Journal on Exploratory Solid-State Computational Devices and Circuits

The *Journal on Exploratory Solid-State Computational Devices and Circuits* is an "Open Access" IEEE journal, for the publication in multi-disciplinary fields of research on solid-state circuits, using exploratory materials and devices for novel energy efficient computation, beyond standard CMOS transistor technology. The Magnetics Society is a cosponsor of the journal.

The papers are selectively chosen to provide an insight into the architectural, circuit and device implications of emerging quantum nano-electronic or nano-magnetic device technologies.

The papers have a maximum of eight pages in length. Additional supplementary materials expand on the methods, novel metrology and/or design techniques in many cases. The supplementary is intended as a published repository of best practices.

The focus of the publication is on the exploration of materials, quantum nano-electronic or nano-magnetic devices and computation circuits, to enable Moore's Law to continue for computation beyond a 10-to-15-year horizon (beyond the end of the roadmap for CMOS technologies), with associated density scaling and improvement in energy efficiency.

This publication provides a unique interdisciplinary forum for scientists and engineers, to advance this field of promising alternatives to CMOS technology for computation devices, circuits and architecture. The journal published its first paper in January 2015, and has a number of seminal papers on the field beyond CMOS.

2016 papers submitted to the journal took an average of:

- 4.5 weeks from submission to First Decision, and

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2017 IEEE Magnetics Society Summer School *cont. from page 1*

students, and between students with lecturers. The lecturers included:

- Michael Coey (Trinity College Dublin, Ireland);
- Jeffery McCord (Universität Kiel, Germany);
- Bernard Dieny (Spintec, France);
- Oliver Gutfleisch (Technische Universität Darmstadt, Germany);
- Puerto Morales (Institute of Materials Science Madrid-CSIC, Spain);
- Thomas Schrefl (Donau-Universität Krems, Austria); and
- Robert Stamps (University of Glasgow, UK).

The Society's 2017 Distinguished Lecturers also presented:

- Hendrik Ohldag (Stanford Synchrotron Radiation Laboratory, USA);
- Eiji Saitoh (Tohoku University, Japan);
- Michael Farle (Universität Duisburg Essen, Germany); and
- Xiaofeng Jin (Fudan University, China).

Two poster sessions took place on Tuesday and Wednesday, and awards were made for the best poster of each session.

A new and special initiative of the Society's Education Committee was introduced at this Summer School, to support student-led projects for the first time. Students who shared common interests in their PhD studies formed groups of approximately five people, to discuss a project in the designated group project time during the School, and via email/Skype beforehand. The winners will be invited to submit and present a poster at the 2018 INTERMAG Conference in Singapore.

16 groups (including a total of 82 students) were formed and they presented their research and financial plans in five-minute talks on the Thursday. Each student had one vote at the end of the presentations, and after tabulating those votes alongside those cast by the Summer School lecturers and Local Organizing Committee Members, the following two projects will be funded:

1. Novel design for a magnetic encoder system

- Christian Huber (University of Vienna, Austria);
- Yaoying Zhong (Nanyang Technological University, Singapore);
- Ana Maria Schönhöbel (BCMaterials, University of the Basque Country, Spain);
- Daniel Simon (Robert Bosch GmbH, Germany); and

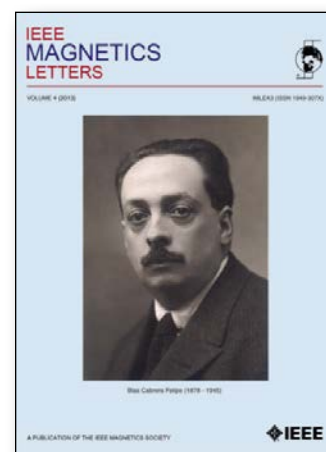
- Chia Chang, (National Tsing Hua University, Taiwan).

2. Spin caloritronics, magnonics and magneto-optical measurements in YIG/IrMn heterostructures on silicon

- Akash Kumar (Indian Institute of Technology, Delhi, India);
- Obed Alves (University of Pernambuco, Brazil);
- Samiran Choudhury (SN Bose National Centre for Basic Science, Kolkata, India);
- Takian Fakhrol (MIT, USA); and
- Thomas Gage (University of Minnesota, USA).

As a part of the School's activities, a tribute took place for Blas Cabrera Felipe, a distinguished Spanish scientist in magnetism. In the 1930s he was also Chancellor of the Summer International University of Santander, the precursor of the present International University Menéndez Pelayo. Prof. Cabrera was the pioneer of modern science in Spain, especially active in magnetism, and was the only Spaniard that participated in the Solvay conferences on the new quantum science - 1930 (Magnetism) and 1933 (Nuclear structure), invited by Marie Curie and Albert Einstein. His scientific contribution was truncated by the Spanish Civil War in 1936 and, after his stay in Paris, he went into exile in Mexico in 1941, where he died in 1945.

Prof. Cabrera appeared on the cover of Volume 4 of *IEEE Magnetics Letters* (2013), together with a short biography written by Ron Goldfarb, editor of the journal. An exhibit about the life and contributions of Prof. Cabrera, titled: "Blas Cabrera Rector and Universal Scientist" was opened on the Monday at the Royal Hall in the Magdalena Palace.



Antonio Hernando analyzed the work of Prof. Cabrera and its legacy in the present sphere of Spanish magnetism. Prof. Hernando is a scientific heir of Prof. Cabrera and is Professor of Magnetism at the Complutense University of Madrid, as well as *Doctor Honoris Causa*, awarded by the University of the Basque Country and the University of Cantabria.

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Reception hosted by the Lady Mayor of Santander (front row, third from left) at the Royal Hall of the Palace



Welcome party on the Magdalena Palace balcony



Exhibit on Blas Cabrera Felipe



Outing to the Guggenheim Museum in Bilbao

Journal on Exploratory Solid-State Computational Devices and Circuits (JXCDC) *continued from page 2*

- 10 weeks from first submission to Final Decision, with Early Publication one week later.

Citation information (as of May 2017) for the papers in the 2015 Issue:

- Average = 21 (14) citations per paper by Google Scholar (IEEE Xplore);
- Highest = 74 (42) citations per paper by Google Scholar (IEEE Xplore);
- Total = 251 (167) citations per paper by Google Scholar (IEEE Xplore).

6429 downloads were made of papers published in 2015; 1104 downloads were made of papers published in 2016.

The JXCDC papers listed order of popularity can be seen online at:

<http://ieeexplore.ieee.org/xpl/topAccessedArticles.jsp?punumber=6570653>

For paper submission details you can go to:

<http://mc.manuscriptcentral.com/jxcdc>

Special MRAM Poster Session at IEDM 2017

By Bernard Diény, Administrative Committee Member and Bruce Terris, Past President

With the rising interest of the microelectronics industry for STT-MRAM and spintronics in general, it is very important to strengthen the links between the IEEE Magnetics Society and the IEEE Electron Devices Society (EDS). The purpose is to contribute to reducing the cultural gap which still exists between the magnetism and microelectronics communities, and thereby ease the penetration of magnetism-based technology into the microelectronics industry.

IEDM (International Electron Devices Meeting) is the main annual conference of the EDS. After discussion with the IEDM organizers, it was agreed to organize for the second time, a special poster session during IEDM 2017 (San Francisco, 4-6 December 2017) which will be entirely dedicated to MRAM (including MRAM materials, phenomena, technology and testing, hybrid CMOS/MTJ technology and circuits, and spin logic). A similar MRAM poster session took place at IEDM 2016 and was quite successful, with 33 posters presented and very active cross-disciplinary discussions.

This session will be organized technically by the IEEE Magnetics Society and will be embedded in the IEDM 2017 conference. It will appear as a special memory session in the IEDM program. This event will be a great opportunity for spintronics students, researchers and engineers to meet

colleagues from microelectronics community. We strongly encourage teams from the magnetism community, working on MRAM, to send attendees to IEDM and to present posters related to MRAM, spintronics circuits or spin logic. during this special posters session.

The posters will be selected by a small international program committee, formed by members of the IEEE Magnetics Society. There will be no publications associated with these posters in the Proceedings of IEDM. Of course, any presenting author can also submit regular digests for oral presentations following the usual procedure of IEDM organization (see <http://www.ieee-iedm.org>). The session will also be used to advertise our Society and our main conferences: INTERMAG and MMM, within the microelectronics community.

If you want to present a poster during the MRAM poster session at IEDM2017, send a half-page abstract to bernard.dieny@cea.fr before 16 September 2017. In the list of authors, underline who will be the presenting author.

The notice of acceptance/rejection will be sent in the beginning of October. Participants in this poster session will still need to register at IEDM as regular attendees.

Magnetics 2018 Conference

By Shannon Given, Program Manager, Magnetics 2018 Conference

Magnetics 2018 will take place during February 8-9, 2018 in Orlando, Florida, USA.

The conference will focus on the latest economic developments and technical advancements in magnetics markets and technologies. The event serves OEM developers of products that utilize magnets and magnet systems, design engineers, OEM developers involved in EMC technology and magnetic effects, magnetics manufacturers and integrators, and material suppliers in the magnetics industry.

The technical sessions will cover the latest advancements in magnetic applications, technology and materials as well as global issues of supply, demand and pricing of magnetic materials. Poster sessions will highlight the latest in R&D as well as interesting technology projects.

The interactive exhibit hall will feature industry-leading companies, with ample time to network with magnet manufacturers, material providers, testing and software companies, as well as an array of component and sub-system providers.

The pre-conference workshops provide an in-depth education experience, providing valuable information for both the new and seasoned engineer.

Magnetics 2018 will provide an excellent forum for learning from industry leaders on new technologies entering the market and what's ahead.

For more information, please visit:

<http://www.magneticsmagazine.com/conferences>

INTERMAG 2017 Conference Report

By Nora Dempsey, INTERMAG 2017 General Chair

INTERMAG 2017 was held in Dublin, Ireland during a chilly but mostly dry week in April.

2060 contributed digests were submitted, 73% of which were accepted, together with 96 invited digests. There were 1470 registrants from over 50 countries (including 45% from Europe, 37% from Asia and 10% from the USA).

The conference featured a tutorial on the *Internet of Things* and eight symposia covering the following topics:

- Magnetocaloric Materials: New Concepts for Energy Application;
- Smart City, Smart Living;
- Bio-Applied Magnetism;
- Additive manufacturing and 3D printing of magnets;
- When THz meets X-rays: An Ultrafast View on Magnetism;
- Magnetic micro- and nano-actuators and robots;
- STT-MRAM: Toward volume production;
- Spin-dependent phenomena in 2D materials and van der Waals heterostructures.

Kazuhiro Hono (NIMS) presented the Plenary Lecture, titled “Recent advances in nano-characterization of magnetic materials and devices.” The conference had 9 sponsors and 22 exhibitors. A Heat-Assisted-Magnetic-Recording demonstrator from Seagate was on display in the poster and exhibit hall throughout the event.

An introductory workshop on J-OOMME, run by Marijan Beg (U. Southampton), was attended by 48 participants.

A total of 35 student travel grants were given to students from around the world, 25 sponsored by the Magnetism Society and 10 sponsored by Science Foundation Ireland.

Two special evening sessions were organized. The first was a panel discussion titled “Who Funds Magnetism Research, and Why?”. Michael Coey (TCD) chaired the session while Mark Fergusson (SFI), Burkhard Jähnen (DFG), Paul Dodd (UC Davis) and John Pethica (NPL) served as panelists.

The second special evening session, “50 years of rare-earth permanent magnets”, was chaired by Oliver Gutfleisch (TU Darmstadt) and featured scientific talks from George Hadjipanayis (U. Delaware), Masato Sagawa (Adviser, Daido Steel) and Rex Harris (U. Birmingham) and a tribute to Irving Mitchell by Michael Coey.

A number of networking events were organized during the meeting. The IEEE Magnetism Society Young Professionals Event featured a talk entitled: “Survival Skills for Scientists and Engineers: things they never told you in school.” by David Jiles (Iowa State University).

The Women’s Networking Event gave an opportunity to attendees to discuss a range of topics including leadership, work-life balance and professional development.

“Meet the Speakers” and “Meet the Experts” lunches provided an informal atmosphere where students were able to interact with experts from the field of magnetism. The three Bierstubes also proved to be very popular.

The Plenary Session finished up with a display of Irish music and dance while the Plenary Reception featured a lively workshop on how to play the Irish drum known as the “bodhrán”! You can find photographs from the event elsewhere in the Newsletter.

New Senior Members

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

April 2017: Carl Helms, Radoslaw Jez, Alexey Kimel, Fabio La Foresta, Patel Reddy and Manfred Schabes.

June 2017: Mairbek Chshiev, Roozbeh Nikkah-Moshaie and Alastair Ruddle.

For further information, visit the IEEE Web site at:

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

INTERMAG 2017 Plenary Session

By Burkard Hillebrands, Honors & Awards Committee Chair

The plenary session of the INTERMAG 2017 Conference in Dublin, Ireland was held on April 26, 2017 at the Convention Center Dublin. It was the central event of the conference, giving the participants the opportunity to gather together, to participate in the Magnetics Society activities such as the award ceremony and the plenary lecture, and to meet afterwards at the reception.

The plenary session was opened by the Conference Chair, Nora Dempsey. She gave a very kind introduction to Ireland and to Dublin, during which she presented a sneak preview into some aspects of the scenery, some landmarks as well as the local beer, Guinness. She also gave an overview of the history of physics and magnetism in Ireland, addressing well-known scientists with relations to Ireland such as Lloyd, Hamilton, Fitzgerald, Stoney, Schrödinger and Larmor.

Next, Prof. Dempsey introduced the Conference Committee and the many volunteers who made the conference such a success. The Conference Committee comprised Adekunle Adeyeye, Cindi Dennis and Jeffrey McCord (Program Chairs), Karsten Rode and Mark T. Kief (Treasurers), Petru Andrei and S. N. Piramanayagam (Publication Chairs), Gavin D'Arcy and Mark Gubbins (Exhibits Chairs), Plamen Stamenov (Publicity Chair), Atsufumi Hirohata (Student Awards), Matt Carey (Student Travel), and Randy H. Victora and Rudi Schäfer (IEEE representatives). The Conference Editor was Laura H. Lewis. Conference managers were Diane Melton and Regina Mohr. Prof. Dempsey also thanked all members of the Program Committee and the Publication Editors. 183 session chairs including co-chairs ensured a smooth operation. The audience thanked them all for their hard work with a big round of applause.

2060 abstracts from all around the world had been submitted and reviewed. 96 invited and 1602 regular presentations (oral and posters) had been accepted from 56 countries.

Before the presentation of awards began, two stalwart contributors to the Magnetics Society who recently passed away were remembered. They were Soshin Chikazumi (1922–2016) and Ami E. Berkowitz (1927–2016).

The Honors and Awards Chair, Burkard Hillebrands, recalled the impact of Sochin Chikazumi on the magnetics community. His research ranged from solid-state physics to magnetic

engineering. In magnetism, his research was focused on magnetism of iron. Its backbone is the Slater-Pauling curve, and the goal was how to increase the magnetization of iron alloys. His research comprised the Permalloy problem, the Invar problem, the magnetic moment of iron nitride, the magnetization mechanism of permanent magnets, and strong magnetic field generation. The Chair also recalled his most famous book "Physics of Magnetism".

Ami E. Berkowitz was also a giant in the field of magnetism. He made groundbreaking discoveries in the physics of exchange-bias phenomena, magnetic nanoparticles, magnetic surface phenomena and magneto-transport. He also pioneered the development of the spark-erosion method for particle production. He also worked in the areas of electron-beam addressed memories, thermomagnetic recording, magnetic tagging, and magnetic printing. He published extensively in the scientific and patent literature, and he co-edited the book "Magnetism and Metallurgy" published by Academic Press with E. Kneller.

The Honors and Awards Chair led the audience through the awards part of the session. The IEEE Magnetics Society Achievement Award is awarded every year to a Magnetics Society member who has made extraordinary contributions to the field of magnetism. Previous recipients have included such distinguished scientists, engineers and managers as Floyd Humphry, Emerson Pugh, Bill Doyle, H. Neal Bertram, Isaak Mayergoyz, John Slonczewski, Michael L. Mallary, Randall H. Victora, Takao Suzuki, and Luc Berger who received last year's award. This award is the highest honor bestowed by the Magnetics Society. William H. Butler, retired professor at the Department of Physics and at the Center for Materials for Information Technology (MINT), The University of Alabama, USA, was the recipient at this conference. The citation reads "For predicting the spin-filter effect and the resulting high magnetoresistance of MgO magnetic tunnel junctions, used by the HDD industry to substantially increase storage density." The award, consisting of a certificate, a \$3000 cash award, a travel allowance and life membership in the Magnetics Society, was presented by Magnetics Society President Dr. Manuel Vázquez.

The newly established Early Career Award was presented for the first time. The Magnetics Society has established this award in order to better support researchers in the earlier period their

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INTERMAG 2017 Plenary Session *continued from page 7*

careers. This award will be given to an individual, nominated no more than 5 years after the completion of his or her PhD, and who has already shown outstanding scientific or technical achievements, which are significantly beyond the average performance of a person at that career level. The Early Career Award consists of a cash award of \$1500 plus a travel award of \$500 plus life membership in the IEEE Magnetics Society. The first and this year's recipient is Wei Zhang, Department of Physics, Oakland University, Rochester, USA "For contributions to the exploration of spin-orbit coupling phenomena with antiferromagnets, magnetic insulators, two-dimensional systems, and topologically non-trivial spin textures."

In 2015, the IEEE Magnetics Society Distinguished Service Award was established to honor outstanding service to the Magnetics Society. Recipients are characterized by sustained voluntary service significantly beyond the typical activities. This award was first presented to Ron Goldfarb, NIST. At this conference, it was awarded for the second time. This year's recipient was Robert E. Fontana, Jr. from IBM. He receives the 2017 Distinguished Service Award "for establishing the structure and enhancing the international impact of major technical conferences sponsored by the IEEE Magnetics Society." The award consists of a certificate, a \$2000 cash award, a travel allowance and life membership in the Magnetics Society. The award was presented by Magnetics Society President Manuel Vázquez.

This year an important IEEE award was received by a member of the Magnetics Society. The IEEE Nikola Tesla Award 2017 was given to Adel Razek, Senior Research Director (Emeritus) and Professor (Honorary), at the National Center for Scientific Research and Centralesupelec, CNRS, Gif Sur Yvette, France. The citation reads "For contributions to coupled multiphysics modeling and design of electromagnetic systems."

In 2017, four members of the Magnetics Society were elevated to the grade of IEEE Fellow, and 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 Laura Heyderman (ETH Zürich), Jordan Katine (HGST), David Lowther (McGill University), and Sara Majetich (Carnegie Mellon University).

Next, the Honors and Awards Chair thanked the 2016 Distinguished Lecturers for the work that they had done in the past year, giving lectures all around the world, and he presented them with Certificates of Appreciation. They were Greg Carman (UCLA, USA), Josep Fontcuberta (ICMAB-CSIC, Barcelona, Spain), Kazuhiro Hono (NIMS, Tsukuba, Japan), and Teruo Ono (Kyoto University, Japan). The new 2017 Distinguished Lecturers were introduced. They are Michael Farle (Univ. of Duisburg-Essen, Germany), Xiaofeng Jin (Fudan University, China), Hendrik Ohldag (SLAC, USA), and Eiji Saitoh (Tohoku University, Sendai, Japan).

The Honors and Awards Chair thanked Bruce Gurney, Chair of the 2016 Joint MMM/INTERMAG conference in San Diego, USA, for organizing an exciting and very successful conference.

It is a good tradition to thank those chairs and members of the Society's Administrative Committee (AdCom) chairs and members who are rotating off. They were called on the stage, where they were presented with Certificates of Appreciation. Outgoing AdCom chairs were Liesl Folks (Nominations), Laura Heyderman (Membership), Chih-Huang Lai (Education), June Lau (Chapters), Sara Majetich (Distinguished Lecturer Program), S.N. Piramanayagam (Technical Committee, and Randall Victora (Conference Executive Committee). Outgoing AdCom members were Jeffrey Childress, Marina Diaz Michelena, Peter Fischer, Masaaki Futamoto, Atsufumi Hirohata, Stéphane Mangin, John Moreland, Rudi Schäfer, Ludwig Schultz, and Masahiro Yamaguchi.

Each year the Magnetics Society sponsors a summer workshop for students, where some 50 students attend a five-day workshop given by some of the best scientists working in in the field of magnetism. This program is run by the Education Committee. Last year, the workshop was held in Sendai in Japan and organized by Kazushi Ishiyama with strong support by Laszek Malkinski. The Honors and Awards Chair thanked them for the excellent workshop.

Next, the Honors and Awards Committee Chair introduced the 2016 Best Student Presentation Award winner and the other finalists. A total of 5 students were selected as finalists following the submission of abstracts to the conference and review of their applications, based on the likely quality and impact of their work. The winner was Philip Lenox from Oregon State Univ., USA, with his presentation "A micro-scale magnetic

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particle imaging scanner.” He received a certificate and a \$1500 cash award. The other finalists were Jyotirmoy Chatterjee (Spintec, France), Maite Goirienea-Goikoetxea (Univ. of Basque Country, Spain), Manu Sushruth (Univ. of Western Australia), and Jiawei Yu (National Univ. of Singapore). They all received a certificate and a \$250 cash award.

As part of its commitment to keeping the field of magnetism vibrant, the Magnetism Society provides travel grants for students to attend conferences sponsored by the Magnetism Society. 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 are given a chance to learn more about how conferences and publications feature into being a professional

scientist or engineer. This year 25 travel grants were awarded by the Magnetism Society. An additional 10 travel grants were sponsored by the Science Foundation Ireland.

The highlight of each Plenary Session is the Plenary Lecture. Prof. Kazuhiro Hono, from the National Institute for Materials Science and the University of Tsukuba, gave an exciting lecture on “Recent advances in nano-characterization of magnetic materials and devices”.

Following the Awards Ceremony, the conference attendees met at the reception and used the opportunity for discussions and exchange.

INTERMAG 2017 Student Travel Grant Reports

By Burkard Hillebrands, Honors & Awards Committee Chair



Each recipient of a student travel grant award from the Magnetism Society (MagSoc) or from the Science Foundation Ireland (SFI) was asked to write a brief summary of their conference experience. The following are extracts from the summaries written after the INTERMAG 2017 Conference in Dublin, sorted alphabetically by the last names.

“INTERMAG is undoubtedly one of the biggest international conferences on magnetism. It is a great opportunity to find out what the international scientific community has to say about

your research. Some reports at the conference have been unexpectedly closely related to my work, so I made contacts with the authors and anticipate possible collaborations. INTERMAG 2017 was definitely worth visiting.”

-- Lev Agafonov, Ural Federal University, Russia (MagSoc)

“Thank you very much for giving us the opportunity to travel to Dublin to attend the INTERMAG conference. It was definitely a very useful and insightful experience to not just get feedback on my own research, but also to learn about the current topics of interest in the field of spintronics. Dublin was a wonderful

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INTERMAG 2017 Student Travel Reports *continued from page 9*

welcoming city and I got the opportunity to enjoy the local culture through the Reception organized at the conference.”

-- *Parnika Agrawal, MIT (SFI)*

“I got opportunities to discuss with experts from academics and industries, about current research in different fields of magnetism. I thank the Magnetic Society for organizing the conference and for the travel grant. ‘If you get a chance to attend INTERMAG, never miss it.’ This is my message to people working in the field of magnetism.”

-- *Pradeep Ala Valappil, Indian Institute of Science (MagSoc)*

“The INTERMAG 2017 conference in Dublin was a great experience for me. Convention Center Dublin has excellent presentation room and facilities. Programs like the “Lunch with an Expert” were very useful for future research positions. I would like to thank the Society for the student travel grant.”

-- *Rajni Bansal, Indian Institute of Technology, New Delhi, India (MagSoc)*

“Participating in INTERMAG 2017 was an extremely enriching experience, which allowed me to expand my network with professionals from around the globe, gain a new outlook on the development of my master thesis, and learn the current state of research in many different fronts of magnetism. I eagerly recommend the event to any young researchers looking for professional development.”

-- *Eduardo Bastos (MagSoc)*

“INTERMAG was important to me for three reasons: 1) learning more about various topics on magnetism and spintronics; 2) networking with students and experts from universities and companies; and 3) learning about the prospect of MRAM for commercialization and future platform for different spintronics devices, especially for Internet of Things.”

-- *Jyotirmoy Chatterjee, Spintec, Grenoble, France (MagSoc)*

“The IEEE granted me a great opportunity to attend INTERMAG in Dublin. The conference was organized at the highest level, with each minute full of real Irish spirit. It gave a chance to see the best scientists of the world, to present my results and to become one step closer to my goals.”

-- *Oleksandr Chumak, Institute of Physics PAS, Warsaw, Poland (MagSoc)*

“By attending the INTERMAG 2017 conference, I had the opportunity to meet with some of the greatest experts in

magnetism, to arrange collaborations, and to network. I wish to thank the IEEE Magnetics Society for supporting me through their Student Travel Grant.”

-- *Héctor Corte-León, National Physical Laboratory, UK (MagSoc)*

“The knowledge transferred during the INTERMAG conference, across subjects ranging from spin transfer torques to magnetic nanoparticles, provided an enormous grounding for those such as myself who are beginning a career in Magnetics. Attending the many invited talks and especially the fantastic plenary has provided me with inspiration to advance my own research and future collaborations.”

-- *Christopher Cox, Loughborough University, UK (SFI)*

“Many thanks to Science Foundation Ireland for sponsoring my travel grant. The conference covered a variety of fundamental as well as applied topics. My own research is interdisciplinary, therefore I benefitted greatly from different sessions, such as on permanent magnets, composites and nanoparticles, bio-medical magnetic therapies and magnetic recording.”

-- *Imants Dirba, TU Darmstadt, Germany (SFI)*

“I was fully impressed with INTERMAG 2017 in Dublin. It provided a very complete overview of ongoing topics on magnetism, as well as focusing on each one specifically. The close interaction with other young researchers and experts there will be very fruitful for my PhD and my future scientific career.”

-- *Jose Angel Fernandez-Roldan, Institute of Materials Science of Madrid / Autonomous University (MagSoc)*

“Attending INTERMAG 2017 in Dublin gave me the opportunity to see the work done by world leaders in magnetism research. My presentation gave me the opportunity to interact with colleagues and researchers interested in my work and to build a good network around the world, for possible collaboration and development of my research career.”

-- *Zuwei Fu, Tongji University, China (MagSoc)*

“Being able to attend INTERMAG Dublin 2017 was a truly enlightening experience. I felt awed at the breadth of knowledge assembled at the conference on such a vast array of topics related to magnetics research. I would like to thank the conference organizers for making this event possible. Seeing the cutting edge research in my own research area will be invaluable to my thesis going forward.”

-- *Thomas Gage, University of Minnesota (MagSoc)*

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INTERMAG 2017 Student Travel Reports *continued from page 10*

"It was a great and enriching experience for me to participate in INTERMAG 2017 in Dublin, Ireland. The conference has provided a great opportunity to meet and interact with students, scientists and professors from both industry and academia. The scientific discussion with them has broadened my research vision. I am very thankful for the travel grant support."

-- Sachin Krishna, *Nanyang Technological University, Singapore (SFI)*

"INTERMAG presented a great opportunity for young researchers like myself. Presenting my work and receiving feedback from leading experts in the field of magnetism in biomedical applications was highly beneficial. After the discussions following my presentation, I have several new ideas for future work that I'm certain will contribute significantly to the remainder of my graduate studies."

-- Philip Lenox, *Oregon State University (MagSoc)*

"The discussion with different speakers broadened my vision of scientific knowledge and inspired new ideas for my future research. My communication skills were improved through the experience of both poster and oral presentations. As my first time to Europe, I also had a wonderful and enjoyable trip during the conference in Dublin. Many thanks to the IEEE Magnetics Society for supporting my attending the conference."

-- Sihua Li, *Nanyang Technological University, Singapore (MagSoc)*

"I am grateful for the travel grant, which gave me the opportunity to attend the INTERMAG Conference in Ireland. I made an oral presentation and I enjoyed the poster sessions as well. I have met many experts and friends and we had sufficient communication on our research work. This conference is fabulous and inspiring. I'd like to express my gratitude again."

-- Zhou Miao, *Nanjing University of Aeronautics and Astronautics, China (MagSoc)*

"Obtaining the travel grant to attend INTERMAG 2017 in Dublin allowed me to learn a lot about my topic and others related to it, thanks to wonderful talks and posters. I had nice discussions and I particularly enjoyed talking with people I already knew, as well as new people. I liked the Awards sessions on Wednesday afternoon because I think it is important to recognize people's work and dedication."

-- Cristina Munoz-Menendez, *Universidade de Santiago de Compostela, Spain (MagSoc)*

"Participation in the INTERMAG2017 was a wonderful experience. It was a great opportunity to broaden my

knowledge about the emerging phenomena in the magnetism field and to exchange ideas with colleagues from all over the world. Also, the feedbacks on my presentation were very useful for my research. I appreciate the Science Foundation Ireland for giving me the travel grant to attend this conference."

-- Shouzhong Peng, *Beihang University, China (SFI)*

"It was a privilege to receive a student travel grant from Science Foundation Ireland, for INTERMAG 2017. The plenary talk, oral presentations and poster sessions have helped to know the broader perspective of the subject with genuine and innovative ideas thereby self-motivated. My hearty thanks and gratitude to the award committee and various personnel involved in conducting such a wonderful and memorable conference."

-- Prabhu Rajagiri, *Indian Institute of Technology Bombay, India, (SFI)*

"I'd like to thank the Society for the travel grant to participate in INTERMAG 2017 - a wonderful opportunity to meet many scholars and PhD students from different universities. It was also very useful in terms of networking, generating ideas, and getting feedback. Being my first time to Ireland, I had a special experience there."

-- Ahmad Salah, *University of Technology Sydney, Australia (MagSoc)*

"I am grateful to the organizers for giving me the opportunity to participate in INTERMAG this year. It was brilliantly organized and was one of the most enriching experiences that I have ever had. It was a great platform to share ideas, attend excellent oral presentations and posters and network with my peers working around the globe. All that I have learned from INTERMAG has inspired me to emulate some of the greatest scientists in the field of magnetism."

-- Titiksha Srivastava, *Spintec/CEA, University of Grenoble Alpes, Grenoble, France (MagSoc)*

"Participation in INTERMAG 2017 in Dublin was a wonderful experience. The opportunity of live communication with famous scientists gave me strong motivation for further research. The discussions during the conference gave me new interesting ideas to think on. I learned much from the various presentations and poster sessions during the conference. I am thankful to the IEEE Magnetic Society for the travel grant."

-- Olga Sulymenko, *Taras Shevchenko National University of Kyiv, Ukraine (MagSoc)*

"I'm very grateful to the Magnetics Society for providing me the opportunity to attend INTERMAG 2017. I had a wonderful

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INTERMAG 2017 Student Travel Reports *continued from page 11*

experience at the conference, where I was able to meet a number of faculty members, post-docs and fellow graduate students from around the world. Not only did I meet potential collaborators, but I was able to learn from some of the experts in the field by attending their talks and meeting them in person. I very much appreciate this award.”

-- *Farheen Syeda, Biomagnetics Lab, Virginia Commonwealth University (MagSoc)*

“INTERMAG was a unique opportunity to get detailed insights into broadly distributed topics on the development of magnetic materials, including those not related to my own research topic, especially the sessions on biomedical applications. For my own research, it was a very important event because one could have very fruitful discussions with many of the absolute experts on the particular fields of research on magnetism.”

-- *Andreas Taubel, TU Darmstadt, Germany (MagSoc)*

“It was a great and exciting experience for me to attend the INTERMAG 2017 Conference in Dublin. I really enjoyed the poster sessions, where I met with so many researchers. I appreciate the IEEE Magnetics Society and Science Foundation Ireland for making possible my attending to this informative and inspiring conference.”

-- *Vitalii Vitko, Saint Petersburg Electrotechnical University "LETI", Russia (SFI)*

“The poster presentations were very useful and helped me to understand the current research in the field of Spintronics. I was greatly privileged to receive the student travel grant from the Magnetics Society, which helped a lot in financially assisting my attendance at this conference.”

-- *Venkateswara Yenugonda, Indian Institute of Technology Bombay, India (MagSoc)*

“I had an amazing experience during INTERMAG 2017. The poster sessions gave me the opportunity to present my work and to discuss it with researchers from both industry and academia. I've also got new ideas from the wonderful talks. These will greatly help me with my future research. I would like to thank the IEEE Magnetics Society for the student travel grant.”

-- *Boyu Zhang, Beihang University, China (MagSoc)*

“I'd like to thank the Society for the travel grant to participate in INTERMAG 2017. InterMag gives me the opportunity to see the work done by world leaders in transformers and inductors. The participation in InterMag2017 was a wonderful experience. I felt so encouraged to give an oral presentation, and I obtained many new ideas and advice from experts in my field.”

-- *Yongheng Zhong, Wuhan University, China (MagSoc)*

INTERMAG 2017 Best Student Presentations

By Burkard Hillebrands, Honors & Awards Committee Chair

The selection of the winner of the Best Student Presentation Award was made at the INTERMAG Conference 2017 in Dublin. All presentations were excellent, and the finalists contributed papers of great interest to the conference attendees. A photo of the finalists can be found elsewhere in the Newsletter.

Congratulations to the finalists and the winner!

Winner: Philip Lenox (Oregon State University).

Title: A micro-scale magnetic particle imaging scanner.

Finalist: Jyotirmoy Chatterjee, Spintec (France)

Title: Dramatic improvement of tunneling magnetoresistance and thermal stability factor of STT-MRAM cells by replacing Ta with W/Ta cap layers.

Finalist: Maite Goiriena-Goikoetxea (U. of the Basque Country, Spain)

Title: Magnetic vortex core sizes and hysteresis loops in sub-100 nm Permalloy dots.

Finalist: Manu Sushruth (U. of Western Australia)

Title: Resonance-based detection of magnetic nanoparticles using nano-patterned ferromagnets.

Finalist: Jiawei Yu (National University of Singapore)

Title: Abnormal backward Néel domain wall motion in double-heavy-metal heterostructures with large spin orbit torques and Dzyaloshinskii-Moriya interaction.

INTERMAG 2017 Plenary Session: In Pictures

Submitted by Burkard Hillebrands, Honors & Awards Committee Chair



Nora Dempsey (left), the Conference Chair, a young attendee, and Manuel Vázquez (right), President of the Magnetics Society.



The new Society President, Manuel Vázquez (right), thanks the outgoing president, Bruce Terris (left), for all his work.

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INTERMAG 2017 Plenary Session: In Pictures *cont. from page 13*



Bill Butler (center) receives the Achievement Award from Burkard Hillebrands (left), Honors and Awards Chair, and Manuel Vázquez (right), President of the Magnetics Society.



Society President Manuel Vázquez (right), and the Honors and Awards Chair, Burkard Hillebrands (left), present certificates of appreciation to two 2016 Distinguished Lecturers, Josep Fontcuberta and Kazuhiro Hono (center).

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INTERMAG 2017 Plenary Session: In Pictures *cont. from page 14*



Honors and Awards Chair Burkard Hillebrands (left) with Outgoing AdCom Chairs (from left to right): Randall Victora, S.N. Piramanayagam, Sara Majetich, Chih-Huang Lai, and Laura Heyderman.



Honors and Awards Chair Burkard Hillebrands (left) with outgoing AdCom Committee Members (from left to right): Rudi Schäfer, Mashiro Yamaguchi, Masaaki Futamoto, Atsufumi Hirohata, Ludwig Schultz, Peter Fischer, Jeffrey Childress, and Stephane Mangin.

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INTERMAG 2017 Plenary Session: In Pictures *cont. from page 15*



Atsufumi Hirohata, Education Chair (left), with finalists of the Best Student Presentation Award, (left to right) Jyotirmoy Chatterjee, Philip Lenox, Jiawei Yu, Manu Sushruth, and Maite Goirienna-Goikoetxea, with Burkard Hillebrands, Honors and Awards Chair (right).



Kazuhiro Hono, NIMS Tsukuba, delivering the 2017 INTERMAG Plenary Lecture.



At the reception: a course in Irish bodhrán playing...



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INTERMAG 2017 Plenary Session: In Pictures *cont. from page 16*



At the reception



At the reception



Conference Calendar

August 2-4, 2017 The 28th Magnetic Recording Conference (TMRC 2017)
Tsukuba, Japan
<http://www.nims.go.jp/mmu/tmrc2017.html>

September 3-6, 2017 18th. Int. Symposium on Applied Electromagnetics & Mechanics (ISEM2017)
Chamonix, France
<http://www.isem2017.org>

September 18-21, 2017 Magnetic Frontiers: Topological Insulators
Nancy, France
<http://topo-insulators.event.univ-lorraine.fr>

October 9-21, 2017 The European School on Magnetism (ESM 2017)
Cargèse, Corsica, France
<http://www.magnetism.eu/66-esm-2017.htm>

November 6-10, 2017 2017 Conference on Magnetism and Magnetic Materials (MMM 2017)
Pittsburgh, Pennsylvania, USA
<http://www.magnetism.org>

December 4-6, 2017 2017 International Electronic Devices Meeting (IEDM 2017)
San Francisco, California, USA
<http://www.ieee-iedm.org>

December 13-15, 2017 Nanomaterials Applied to Life Sciences (NALS)
Gijón, Spain
<http://www.nals2017.es>

February 8-9, 2018 Magnetics 2018
Orlando, Florida, USA
<http://www.magneticsmagazine.com/conferences/>

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.

Contributions are solicited from Magnetics Society members, conference organizers, Society Officers & other volunteers, local chapters, and other individuals with relevant material. The Newsletter is published quarterly on the Magnetics Society webpage at

<http://www.ieeemagnetics.org>.

Please send articles, letters & other contributions via email to the Newsletter Editor, Gareth Hatch, at g.p.hatch@ieee.org.

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