NUCLEAR & PLASMA SCIENCES SOCIETY NEWS

A Publication of the Institute of Electrical & Electronics Engineers

Number 1, March 2012

CONFERENCES

2012 Real Time Conference Slated for Summer 2012

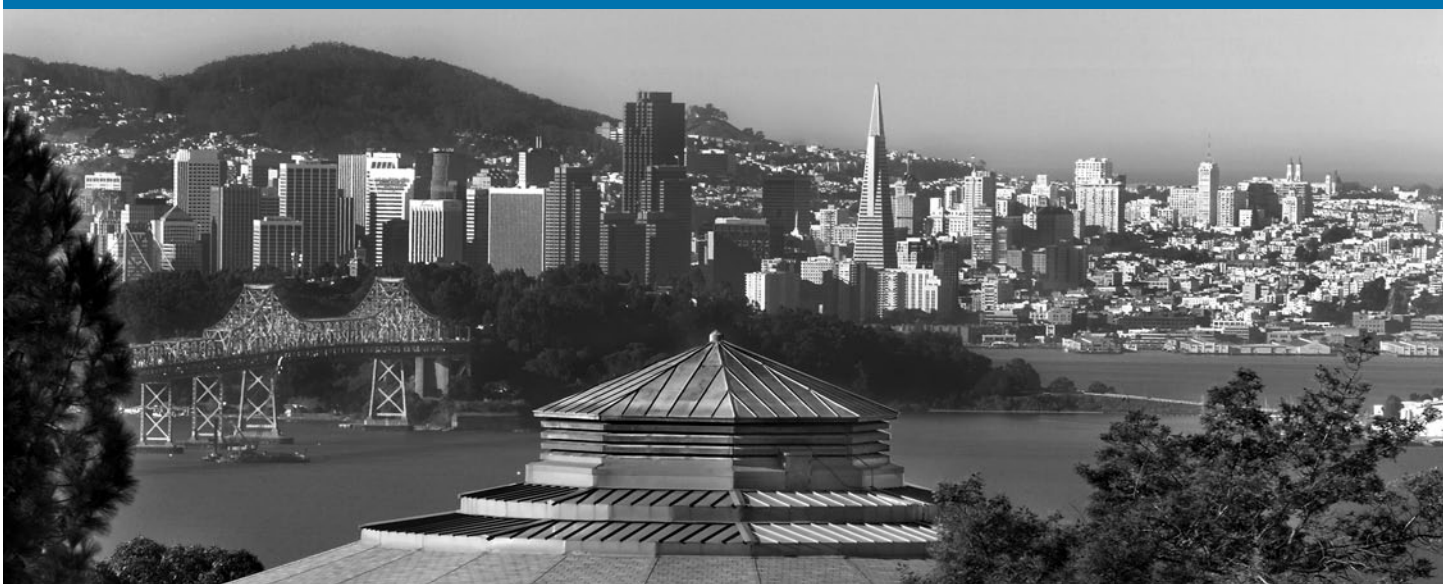

Photo courtesy of Lawrence Berkeley National Laboratory

We look forward to welcoming you at the 2012 IEEE-NPSS Real Time Conference (RT2012), to be held from June 11th to 15th in Berkeley, California at the freshly renovated Shattuck Plaza Hotel. The conference is hosted by the Lawrence Berkeley National Laboratory (LBNL) with Sergio Zimmermann as General Chair. The location is close to public transportation (BART) and to many other hotels and restaurants in the downtown Berkeley area as well as within walking distance of the University of California.

The conference is devoted to the latest developments in real-time techniques in the fields of particle physics, nuclear and astrophysics, plasma and nuclear fusion, medical physics, space science, accelerators, and general nuclear power and radiation instrumentation. The conference returns to the U.S. after the RT2010 in Lisbon, Portugal and the first Asian conference of this series, RT2009, held in Beijing, China. The proximity to several research laboratories and universities in California's San Francisco Bay Area provides a great opportunity to meet people from these and to learn about new developments in our field. Following the Beijing and Lisbon meetings there is now significant attendance from Asia and from the fusion technology community, so there is a great opportunity to meet specialists with diverse interests from all over the world.

The conference will have only plenary sessions, as in the past. This encourages people to look at real-time developments in quite different sectors from their own; this greatly fosters the interdisciplinary exchange of ideas in our field. The poster sessions will be accompanied by "mini-oral" presentations. These 2-minute oral presentations already have a long tradition in this conference and are extremely helpful in highlighting the posters for the

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NUCLEAR & PLASMA SCIENCES SOCIETY NEWS
(USPS 000-560) is published quarterly by the Nuclear & Plasma Sciences Society of the Institute of Electrical and Electronics Engineers, Inc. Corporate Office: 3 Park Avenue, 17th Floor, New York, NY 10017-2394. Printed in the USA. One dollar per member per year is included in the Society fee for each member of the Nuclear & Plasma Sciences Society. Periodicals postage paid at New York, NY and at additional mailing offices. Postmaster: Send address changes to Nuclear & Plasma Sciences News, IEEE, 445 Hoes Lane, Piscataway, NJ 08854.

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Publicity releases for forthcoming meetings, items of interest from local chapters, committee reports, announcements, awards, or other materials requiring society publicity or relevant to NPSS should be submitted to the Newsletter Editor by April 5th, 2012 for publication in the June 2012 Newsletter.

News articles are actively solicited from contributing editors, particularly related to important R&D activities, significant industrial applications, early reports on technical breakthroughs, accomplishments at the big laboratories and similar subjects. The various Transactions, of course, deal with formal treatment in depth of technical subjects. News articles should have an element of general interest or contribute to a general understanding of technical problems or fields of technical interest or could be assessments of important ongoing technical endeavors.

Advice on possible authors or offers of such articles are invited by the editor.

CONFERENCES

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entire general audience. The conference will also have an industrial exhibit running through the week.

Short courses on June 9th and 10th will highlight some hot subjects and include a two-day xTCA workshop. On Wednesday afternoon two excursions are offered, either to Napa Valley or to downtown San Francisco.

Conference attendees will have access to wireless Internet. The hotel rooms offer state-of-the-art media hubs to connect laptops to the in-room flat-panel high definition TV.

CONFERENCE PROGRAM

The committee has assembled an interesting program in various areas of real-time computing applications and data acquisition covering these fields:

- High energy physics
- Nuclear and particle physics
- Particle astrophysics
- Medical physics
- Nuclear fusion
- Real-time security and safety
- General radiation instrumentation

The topics in these fields have been slightly updated from previous conferences and cover these areas:

- Real-time system architectures
- Intelligent signal processing,
- Programmable devices (FPGAs, GPUs, DSPs)
- Fast data-transfer links and networks
- Trigger and data acquisition systems
- Online processing farms
- Control, monitoring and test systems
- Upgrades of existing large and smaller systems
- Emerging real-time technologies
- New standards such as xTCA
- Real-time safety and security
- Feedback and experiences

The last topic, in particular, is new to this conference. Rather than showing only great achievements on glossy slides it also can be very helpful to learn from other people's difficulties, problems and even mistakes. This way of looking at things will be cultivated further by explicitly including this topic. An invited speaker will give an overview of each field at the opening of each session. The program committee has ensured that overlapping talks, for example in high-energy physics, are merged into single talks.

Each talk or poster actually presented qualifies for the Conference Record, an unrefereed publication intended to be published promptly after the conference. IEEE will also publish peer-reviewed papers in a special conference-related issue of the *IEEE Transactions on Nuclear Science* (TNS).

At the conference banquet four Outstanding Student Paper Awards will honor the best student submissions accepted for oral or poster presentation. The CANPS senior award will be given to an individual who has made outstanding contributions to our field. The location of RT2014 will be announced at the end of the conference, and will take us back to Asia.

Travel and hotel information, presentation tips, details about the exhibits and the full program can be found on the conference web site at http://rt2012.lbl.gov.

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Stefan Ritt
Chair, CANPS Technical Committee

Sergio Zimmermann
RT Conference General Chair

Potty time

Part of the job may involve being required to provide technical support during evening or overnight. You will be given time off in loo for this.

On a UK job web site

ICOPS 2012 to be Held 8–12 July 2012 in Edinburgh, United Kingdom

Micheal Kong
General Chair

Christine Coverdale
Technical Program Chair

The 39th annual IEEE International Conference on Plasma Science (ICOPS) will be held in historic Edinburgh, United Kingdom from July 8 through July 12, 2012. The Conference Chair is Dr. Michael Kong of Loughborough University, UK. Dr. Christine Coverdale of Sandia National Laboratory, USA will serve as technical chair. An exciting scientific program is planned for the 2012 meeting covering:

- Basic Processes in Fully and Partially Ionized Plasmas
- Microwave Generation and Plasma Interactions
- Charged Particle Beams and Sources
- High Energy Density Plasmas and Applications
- Industrial, Commercial and Medical Plasma Applications
- Plasma Diagnostics
- Pulsed Power and Other Plasma Applications

The timing for the 2012 conference is very special in many ways, particularly because several important landmark breakthroughs in plasma science and technology in recent years will be showcased in Edinburgh. These include fundamental science in ecton processes and warm dense matter, through high energy density plasma physics and electron beam physics, to the emerging interdisciplinary areas interfacing plasmas with micron- and nano-scale science, biology and medicine, and pulsed power technology. The location of Edinburgh will see a greater participation than usual from Europe where plasma diagnostics and simulation has been a traditional strength and some of the interdisciplinary plasma research is being pioneered.

ICOPS 2012 is therefore a unique forum to sample and showcase the most exciting discoveries in plasma science, to engage with leading experts, and to update one's understanding how today's plasma science impacts on science policy, industry and society. The technical program of ICOPS 2012 will be led by seven plenary speeches and a program of invited talks (to be selected from abstracts submitted), many given by academicians, international award winners, and Fellows of IEEE. The plenary sessions will be given by international leaders of plasma science:

- Prof. Gennady Mesyats, Academician, the Russian Academy of Sciences; 2012 winner of IEEE Marie Sklodowska-Curie award
- Prof. Andrew Ng, Fellow of IEEE and APS, Univ. of British Columbia, Canada, 2012 Winner of IEEE Plasma Science and Applications award
- Prof. Alan Phelps, Fellow of APS, IoP and Royal Society of Edinburgh, Univ. of Strathclyde, UK
- Prof. J. Gary Eden, Fellow of IEEE, APS, and AAAS, Univ. of Illinois Urbana-Champaign, USA
- Prof. Martin Gundersen, Fellow of IEEE and OSA, Univ. of Southern California, USA
- Prof. Kostya (Ken) Ostrikov, Plasma Nanoscience Center Australia (PNCA)
- Dr. Andrew Randewich, Fellow of IoP, Atomic Weapons Establishment (AWE), UK.

Plenary and invited papers presented at the meeting will be published, subject to the usual peer-review process, in a special issue of the IEEE Nuclear and Plasma Science Society (NPSS) journal *IEEE Transactions on Plasma Science*.

In addition to the conference, a mini-course on the rapidly growing field of Plasma Medicine and Plasma Healthcare will be offered by medical doctors who have used plasmas in medicine, plasma scientists who have ventured into biomedicine, and the technology translators who have been involved in successful implementation of plasma technologies in healthcare facilities. This will be the first time that a specialist mini-course of prospective, reviews and tutorials will be dedicated to plasma healthcare, covering basic sciences of relevant disciplines (e.g., plasma physics and chemistry, cell biology, and microbiology), key successes of plasma-mediated biomedical effects (e.g., bacterial and prion inactivation, food decontamination, tissue ablation, skin and wound disinfection, blood coagulation, wound healing, cancer therapies). The very high level of interdisciplinarity both in the background of the minicourse instructors and the topics of the minicourse makes it an exceptionally rare opportunity to gain an in-depth understanding of the scientific basis, the opportunities and the challenges in plasma medicine within one-and -a half days. The mini-course will complement seamlessly the scientific presentations in plasma medicine that will be given during the main technical program.

As a major European city, Edinburgh needs no introduction with its rich history and heritage. It offers a rare opportunity to experience Scottish history and culture as well as the modern way of life in Scotland. It is also an excellent location to explore many areas of historic significance surrounding Edinburgh. The quality of Edinburgh as a European cultural center rivals the quality of the scientific program of ICOPS 2012, making ICOPS 2012 the plasma conference of choice in 2012.

The conference venue will be the Edinburgh International Conference Centre (EICC). Additional details regarding the meeting including the social programs in this historic venue as well as organizing your trip may be found at: http://icops2012.lboro.ac.uk/.

Flushed with success

[Food writers are a profession that] alone among all human vocations culminates in ignoble defecation.

Jay Jacobs

2012 IEEE NSREC is Finalizing Technical Session Plans for Miami

The 2012 IEEE Nuclear and Space Radiation Effects Conference will be held July 16-20, 2012, at the InterContinental Miami in Miami, Florida. The conference will feature a Technical Program consisting of nine sessions of contributed papers (both oral and poster) that describe the latest observations and research results in radiation effects, a Short Course offered on July 16th, a Radiation Effects Data Workshop, and an Industrial Exhibit.

TECHNICAL PROGRAM

Chaired by Christian Poivey, ESA/ESTEC, the papers to be presented at this meeting will describe the effects of space, terrestrial, or nuclear radiation on electronic or photonic devices, circuits, sensors, materials and systems, as well as semiconductor processing technology and techniques for producing radiation-tolerant devices and integrated circuits.

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Teresa Farris
Radiation Effects Vice Chair, Publicity

Just so!

The end may justify the means as long as there is something that justifies the end.

Leon Trotsky

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The conference will be attended by engineers, scientists, and managers who are concerned with radiation effects. International participation in the conference is strongly encouraged.

Poster and Data Workshop chairs will be Steve Buchner, Naval Research Laboratory and Paul Eaton, MicroRDC, respectively. The Technical Sessions and Chairs are:

- *Basic Mechanisms of Radiation Effects*: Harry Hjalmarson, Sandia National Laboratories
- *Dosimetry*: Ari Virtanen, University of Jyvaskyla
- *Hardness Assurance*: David Hansen, Maxwell Technologies
- *Hardness by Design*: Andrew Sternberg, Vanderbilt/ISDE
- *Photonics Devices and ICs*: Jim Pickel, PRT
- *Radiation Effects in Devices and ICs*: Kirby Kruckmeyer, Texas Instruments
- *Single Event Effect Mechanisms and Modeling*: Marta Bagatin, INFN
- *Single Event Transients*: Matthew Gadlage, NAVSEA-Crane
- *Single Event Effects in Devices and ICs*: Melanie Berg, MEI/NASA-GSFC
- *Space and Terrestrial Environments*: Insoo Jun, NASA-JPL

2012 Short Course—***Testing and Simulation Methods for Characterizing Radiation Effects in Advanced Electronics*** is chaired by Ron Schrimpf, Vanderbilt University. This short course will provide an introduction to space radiation environments and their effects on devices and systems for those new to the field, as well as introducing advanced concepts and emerging issues for those experienced in the field. The 2012 Short Course will cover topics ranging from the interaction of radiation with electronic materials, to device response, to effects on system reliability. Topics and presenters are:

- *Single-Event And Total Dose Testing For Advanced Electronics*: Jonathan Pellish, NASA/GSFC
- *Single-Event Effect And Soft-Error Rate Prediction* : Kevin Warren—Vanderbilt University/ISDE
- *System-Level Single-Event Effects*: Subhasish Mitra, Stanford University, Department of Electrical Engineering and Department of Computer Science
- *Radiation Effects In Emerging Technologies*: Steven Koester, University of Minnesota, Department of Electrical and Computer Engineering

Teresa Farris, the Radiation Effects Technical Committee's Vice Chairman for Publicity can be reached via E-mail: Teresa.farris@aeroflex.com

Watch my lips

Success depends on three things: who says it, what he says, and how he says it; and of these three things, what he says is the least important.

Viscount Morley

NSS-MIC-RTSD, Valencia, Spain

David Townsend
General Chair

The 2011 IEEE Nuclear Science Symposium, Medical Imaging Conference, and 18th International Workshop on Room-Temperature Semiconductor X-ray and Gamma-ray Detectors were held at the Valencia Conference Center and Sorolla and Meliá hotels in Valencia, Spain, from October 23 to October 29, 2011. There were 2260 registered attendees and 1692 presentations. These numbers confirm the trend of achieving higher attendance for events held in Europe, a trend maintained ever since the first meeting held in Lyon, France to celebrate the millennium in 2000. At this latest European meeting, the first to be held in Spain, there were two workshops immediately before the conference and one on the Sunday afterwards. Six short courses were offered resulting in a record attendance of over 370 students. The continuous training program was further complemented by scheduling seven refresher courses and, even with an early 7:30 am start, many courses experienced an attendance similar to that of the main scientific sessions.

At this meeting, the venues for the activities included the Valencia Conference Center (VCC) and rooms at the Sorolla and Meliá Hotels that were used for posters and various oral sessions. According to feedback received from the attendees, this distribution of events did not impose any major restrictions on the activities.

The success of the scientific sessions was made possible by the outstanding efforts of all the Program Chairs, Topic Conveners, and Session Chairs. NSS regrouped the 21 topics offered on previous occasions into just five, assigning two conveners per topic to organize the sessions. Consequently, there were 441 NSS posters as well as 108 RTSD posters that were displayed from Monday 24th October to Wednesday 26th October in two poster areas. The NSS Program was completed with 336 oral presentations. Once again, the NSS and RTSD Program Chairs worked together successfully to eliminate as many overlapping and conflicting papers as possible.

With contributions solicited for 13 topics, the MIC received 765 submissions and they accepted 684, comprising 131 orals and 553 posters. As for NSS and RTSD, all MIC posters were displayed during the whole period of the MIC in the two poster rooms.

In terms of attendees, it is of interest to note that 51% of participants came from Europe, 28% from the USA, 16% from Asia (mainly from China, Japan, Korea and Singapore) and 5% from other parts of the world, including Australia; there was a similar distribution for the presentations across geographical region.

It is also a pleasure to report that with the usual financial sponsors of the meeting that contribute each year, together with some new industrial and governmental support, we were able to award 178 trainee grants, an increase of 31% over 2010. These grants are of great importance as they allow young researchers to attend the meeting and meet more senior scientists to exchange ideas and results. Many younger researchers, and especially those from developing countries, would not be able to attend the meeting without such an award.

This year as many as 44 companies participated in the industrial exhibition. The exhibition was located in two areas on two different levels and, as for

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Do say!

The most effective way to do it, is to do it.

Toni Cade Bambara

(continued from page 7)

previous meetings, provided a valuable and lively meeting point for researchers and commercial participants.

Participants and their companions were able to enjoy fully the attractive region of Valencia, including its compact and cultural downtown, its more modern areas, the port and maritime region, thematic parks and the beautiful surrounding environment. Eleven tours offered for the companion program made the visit to Valencia even more enjoyable. The weather cooperated to a large extent, allowing the attendees to experience a mix of sunny and warm days with a few rainy days. The welcome event for the attendees on the evening of Sunday, October 23rd was graced with a beautiful rainbow!

In terms of recognition, it is mandatory to mention the 2011 committee members, the local committee and all the staff for their dedication and outstanding efforts on behalf of the conference, efforts that were directly responsible for the success of this complex event. Special mention should also be made of the 35 enthusiastic volunteers from all over Spain who provided dedicated support for many aspects of the conference. Finally, the 2011 IEEE NSS-MIC-RTSD organizing committee want to sincerely thank all attendees who took the time and made the effort to travel to Valencia and contribute to the success of the meeting.

David W. Townsend, General Chair of the 2011 NSS MIC RTSD can be reached at: Singapore Bioimaging Consortium, 11, Biopolis Way, #02-02 Helios, Singapore 138667; Tel: +65 6516 7408; Fax: +65 6516 8433; E-mail: david_townsend@sbic.a-star.edu.sg.

Reflection

A book is like a mirror. If an ass looks in, you can't expect an apostle to look out.

G. C. Litchenberg

Patrick Le Dû
Transnational Conferences Liaison

ANIMMA 2011, Ghent, Belgium

The second international *Advancements in Nuclear Instrumentation Measurement Methods and their Applications* conference (ANIMMA) was held from 6th to 9th June 2011 at the International Convention Center (ICC) of Ghent in the heart of Belgium.

This conference was organized by the Belgian Nuclear Research Centre SCK-CEN under the chairmanship of Prof. Michel Giot and Marc Schyns, in close partnership with the French Atomic Energy Commission (CEA) and the University of Provence, all aware of the importance of instrumentation and measurement at the heart of nuclear activities and the considerable impact of these sciences on many other fields of activity.

The originality of the ANIMMA conferences is based on its capacity to offer a unique opportunity to the communities of scientists, researchers, engineers and students who are interested in or actively involved in nuclear instrumentation and measurement methods, to have access to an interdisciplinary forum that bring together worldwide experts in the fields of Nuclear Physics, Reactors, Fuel Cycle, Safety and Security, Environmental Applications, Health Applications as well as Education and Training in Nuclear Sciences.

The program is focused on instrumentation, but emphasizes the latest developments in all measurement stages: nuclear radiation detection and in-pile measurements, modeling, electronics, signal acquisition and analysis, interpretation and associated training/education activities.

This second conference was attended by 299 participants from 33 countries and five continents; 193 submissions of high scientific and technical quality were presented. In addition, a commercial exhibit featured 16 companies and a one-day short course was held on nuclear radiation detection, "Principles and applications from today to tomorrow."

The program was divided into plenary sessions with 33 invited and selected lectures made by a broad set of specialists and renowned scientists from around the world who reviewed the state of the art and gave insight into new developments in the various conference areas. In order to stimulate interaction between participants within and across the different fields of expertise, a new type of organization was designed that gave participants an innovative twist on the traditional conference poster presentations. Instead of poster panels, a set of private lounges was used where small groups of participants (typically 15) attended "parallel intensive oral" sessions. Each of these sessions involved three to four papers (15 minutes + discussion) presented interactively by their authors under the guidance of a chairperson. A large (A0 size) flat screen display monitor was used with MS PowerPoint-compatible files that were displayed interactively—a graph or a graphic could be 'built' during the presentation, for example. In total, there were 160 'intensive oral' presentations divided into 29 one-hour sessions in seven parallel lounges.

Participants could view any presentation made at the conference during 'replay open sessions' which had free access time slots. This innovative experience was particularly well appreciated by the audience as well as the authors.

This conference is technically cosponsored by IEEE NPSS. The proceedings are accessible in IEEE Xplore and some selected papers were submitted for special issues of *IEEE Transactions on Nuclear Science* and *IEEE Transactions on Plasma Science*.

The success of the second ANIMMA has confirmed the real interest in this conference and the justification for its objectives which make it unique; thus, ANIMMA is now becoming a regular conference with a periodicity of two years.

The Third International Conference on Advancements in Nuclear Instrumentation, Measurement Methods and their Applications—**ANIMMA 2013**—will be organized by CEA France. It will take place in June 2013, at the Marseille Parc Chanot Congress Center as in 2009.

More information about the 2011 conference is available at http://www.animma.org

Questions regarding the technical program for these conferences should be addressed to the Local Organizing Committee Chairs: for 2011: Marc Schyns, mschyns@sckcen.be; for 2013: Abdallah Lyoussi, abdallah.lyoussi@cea.fr.

Patrick Le Dû, our Transnational Conferences liaison, can be reached via E-mail: p.ledu@ipnl.in2p3.fr.

But persuades the majority

In our time political speech and writing are largely the defence of the indefensible.

George Orwell

Too spaced out, alas!

Everyone is a genius at least once a year, a real genius has his original ideas closer together.

G. C. Litchenberg

Andy Goetz
General Chair of ICALEPCS 2011

ICALEPCS 2011, Grenoble, France

The International Conference on Accelerator and Large Experimental Physics Control Systems (ICALEPCS) is a biennial conference series inaugurated by a number of control system specialists from accelerator laboratories around the world. It has been technically cosponsored by IEEE NPSS since the early 1990s.

The 13th ICALEPCS conference was held from the 10th to the 14th October at the World Trade Center (WTC) in Grenoble, France. It was hosted by the European Synchrotron Radiation Facility (ESRF). The conference was endorsed by the European Physics Society/ Experimental Physics Control Systems (EPS/EPCS), the Institute of Electrical and Electronics Engineers Nuclear and Plasma Sciences Society (IEEE NPSS), the French Society of Physics (SFP Interdivision Physique des Accélérateurs et Technologies Associées), the Physical Society of Japan (JPS), the Particle Accelerator Society of Japan (PASJ), and the Association of Asia Pacific Physical Societies (AAPPS). The conference's Local Organizing Committee was advised by two committees made up of members from the three regions—the International Scientific Advisory Committee (ISAC) and the Program Committee (PC). The ISAC was comprised of 47 members and chaired by Roland Mueller from the Helmholtz-Zentrum Berlin (HZB-GE). The PC was made up of 39 members and chaired by Jean-Michel Chaize of the ESRF.

ICALEPCS 2011 had a record attendance. In total 625 registered. Of these 415 were delegates, 54 were one- or two-day only attendees, 38 were students or retirees, 18 were sponsors or VIPs, 21 were accompanying persons, 31 were editors or assistants. CERN was the most represented institute followed by the ESRF. The breakdown of attendees by region is as follows: 53 for Asia and Oceania, 451 for Europe, the Middle East and Africa, 99 for North and South America.

A total of 573 abstracts were submitted of which 171 were withdrawn. Out of the remaining 402 abstracts 112 were awarded oral status (this includes the keynote and invited talks) and 290 were posters. Mini-orals were introduced for the first time at ICALEPCS. During the mini-oral the speaker was given 3 minutes to present poster highlights. Thirty-one posters were presented as mini-orals.

ICALEPCS 2011 put strong emphasis on a large number of quality keynote speakers. For the first time seven specialists from outside the community presented keynote talks. The feedback on the keynotes from the attendees was very positive proving they clearly contributed to the success of the conference in terms of the quality of the conference and attracting attendees.

The conference themes were chosen by the ISAC. The scientific program was drawn up by the PC. Both committees did an excellent job choosing topics and talks and encouraging experts to present their work. A number of institutes were represented at ICALEPCS for the first time. Parallel sessions were reintroduced. Out of a total of 20 sessions, seven were parallel.

Six preconference workshops were held on the Sunday before the conference. The workshop themes were: Open Hardware Initiative, Cyber-Security, TANGO, jddd, and CDM (Common data model). The attendance at the preconference workshops was again very high with over 200 participants.

Or is there?

One of the good things about being God is that there is not much competition.

Zeeya Merali

Tutorials were reintroduced at ICALEPCS 2011. The two presented were: *Control Theory and Application to Accelerators and Fusion Reactors* by Stefan Simrock and *Implementing DSLs with Xtext and MPS* by Markus Völter. These were much appreciated by the attendees. A round-table discussion was held with some of the keynote speakers on *When and How to Mix Languages: If Not, Why Not?*

For the second time the ICALEPCS Lifetime Achievement Award (LAA) was given. The 2011 award was presented to: Emmanuel Taurel (ESRF), Nicolas Leclerq (SOLEIL), and Pascal Verdier (ESRF) for their contributions to the TANGO collaboration over the last 10 years.

For the first time a selection of the ICALEPCS papers will be published in a peer- reviewed journal: *Physical Review Special Topics Accelerators and Beams* (PRST-AB) with a special edition mid 2012. All papers presented at ICALEPCS 2011 were eligible to be submitted for consideration. The unreviewed proceedings are available on the Joint Accelerator Conferences Website http://www.jacow.org

The Local Organizing Committee (LOC), chaired by Anne-Françoise Maydew, complemented the high-quality scientific program with an excellent social program including a welcome reception at the modern art museum hosted by the city of Grenoble. Conference attendees were also treated to typical French culinary specialties (cheese and wine) and dancing (including the famous French can-can!) and an outing to the Château de Vizille. A gala evening was organized in an unusual venue—the Grenoble ice rink—where attendees were treated to a world-class French magic show. The post-conference tour was to Chamonix.

The ISAC accepted the bid for ICALEPCS 2015 to be held in Melbourne (Australia) hosted jointly by the Australian Synchrotron and the Australian Nuclear Science and Technology Organization (ANSTO).

The next ICALEPCS will take place October 5th–11th, 2013 in San Francisco, California, USA, and will be hosted by the National Ignition Facility (NIF).

More information about ICALEPCS 2011 can be found at http://www.esrf.eu/icalepcs2011/index.htm.

Andy Goetz, General Chair of ICALEPCS 2011 can be reached at the European Synchrotron Radiation Facility ; 6 rue Jules Horowitz BP220 ; 38043 Grenoble Cedex—France; Tel : +33 (0)4 76 88 21 30; E-mail: andy.gotz@esrf.fr. Patrick Le Dû, IEEE NPSS Transnational Conferences liaison, can be reached via E-mail: p.ledu@ipnl.in2p3.fr.

No winner—yet

Human history becomes more and more a race between education and catastrophe.

H. G. Wells

Mirror reflection

Study without reflection is a waste of time; reflection without study is dangerous.

Confucius

Janet Barth
IEEE NPSS Vice President

Vice President's Report

As we start the year 2012, I would like to welcome all of our new IEEE and NPSS Society members and hope that you have already begun to feel a part of the wonderful organization that you have joined. I also invite every returning member to reach out to our new membership to engage their support for activities in NPSS Publications, Conferences, and Chapters. As I look back on my early years as a member of the IEEE and NPSS, I am thankful for the senior members of the Radiation Effects Technical Committee who invited me to get involved in the NPSS by reviewing papers, providing logistics support at conferences, and eventually serving on conference committees. The growth of the IEEE and NPSS is not possible without the mentorship of our newest members.

The NPSS Administrative Committee (AdCom) consists of directly elected members plus ex officio members. The directly elected members are nominated and elected by the membership of their NPSS Standing Technical Committees. The ex officio members include the Chairpersons of our eight Standing Technical Committees, Chairpersons of our Functional Committees, and Liaison Representatives. Each Standing Technical Committee is responsible for advancing the theory and practice of electrical and electronic engineering and of the allied arts and sciences within its field of interest and for maintaining high scientific and technical standards among its members. Each Technical Committee aids in promoting close cooperation and exchange of technical information among its members and affiliates by organizing conferences for the presentation and discussion of original contributions, publishing transactions that report advances within the Committee's field of interest, and providing for the needs of its members and affiliates. Functional Committees cover a myriad of responsibilities examples of which are nominations, conferences, publications, awards, finance, chapters, fellows, communications, standards, international membership and others as necessary. Liaison Representatives ensure that the NPSS has close ties with special interests such as, U.S. energy and R&D policy, education, humanitarian challenges, societal impacts of technology, Women in Engineering activities, and international conferences.

As we start off our NPSS 2012 program, we have the pleasure of welcoming our new Technical Committee Chairs Suleman Surti for the Nuclear Medical and Imaging Sciences Committee (NMISC), and Ed Lampo for the Radiation Instrumentation Steering Committee, whose terms started on January 1, 2012. We would also like to thank Robert Miyaoka for the excellent job he did serving as the previous Chair of the NMISC and Chuck Melcher for his excellent work for RISC. We would also like to welcome our four newly elected AdCom members Kay Chesnut (Radiation Effects), Christine Coverdale (Plasma Sciences and Applications), Mark Crawford (Pulsed Power) and John Sethian (Fusion Technology). We thank our outgoing members, David Abe (Plasma Sciences and Applications) and Hutch Neilson (Fusion Technology). My term as AdCom representative from Radiation Effects also ended.

One of the greatest pleasures of being a member of the NPSS AdCom is the opportunity to work on an international committee which has international representation via directly elected members and ex officio members. NPSS conferences are held in the U.S., Canada, Europe, and Asia. Regardless of where the conference is held, membership on a conference committee guarantees the opportunity to work with colleagues around the world. The IEEE is divided into ten geographic Regions worldwide. Within those Regions are 330 local Sections and more than 1,700 technical Chapters that unite local members with similar technical interests. Some of the Sections are also grouped together in regional Councils. Members of the IEEE automatically become members of their local IEEE Section, allowing them to share technical, professional and personal interests with others in IEEE's worldwide member community. Steven Gold, Functional Committee Chairperson for Chapters, oversees NPSS chapters throughout the world including those in the U.S., Canada, Europe, Russia, Ukraine, and Asia. The NPSS looks forward to welcoming our first chapter from China. Our Transnational Functional Committee Chairperson, Jean-Luc Leray, tracks international participation in NPSS and reports growth in international membership with subsequent grassroots organization of workshops and conferences. Finally, NPSS has responded to the IEEE Humanitarian Challenge by supporting the Community Solution Initiatives that developed a technical model to bring home lighting to very poor rural areas. The pilot program in Haiti has been successful with plans moving ahead to transfer the manufacture of home lighting charging units to Haiti to establish the foundations of a viable business in Haiti. Ray Larsen, a past NPSS president and our liaison to this effort, has led this work

As the NPSS AdCom looks forward to taking on the new challenges of paperless publishing and electronic membership, we look to our past accomplishments with the confidence that AdCom and our Publications Committee have representatives from a diverse technical and international community who are well qualified to chart a successful future for our IEEE and NPSS membership.

Janet Barth, IEEE NPSS Vice President, can be reached at NASA Goddard Space Flight Center, Phone: +1 301 286-5118; Fax: +1 301 286-4973; E-mail: Janet.L.Barth@nasa.gov.

Impossible possibility

Science does not make it impossible to believe in God. It just makes it possible to not believe in God.

Steven Weinberg

Point of view

An intelligent man finds almost everything ridiculous, a wise man hardly anything.

Goethe

In the limelight

The probability of someone watching you is proportional to the stupidity of your action.

A. Kindsvater

Albe Larsen
NPSS Secretary and Newsletter Editor

Secretary's Report

AdCom met in Valencia, Spain, on Saturday, October 29, 2011. Craig Woody chaired the meeting in the absence of both Bob Reinovsky, president, and Janet Barth, vice president.

The society is staying on course financially despite some major changes in the publications income stream. We may see more of an impact in 2012 and beyond. However, we continue with a problem of slow conference closings and this may become more of an issue than a number of fines since IEEE's tax-exempt status is threatened by this. The new Institute auditors are increasing pressure to clean up the backlog of unclosed conferences and to shorten the time to closure after a conference ends. It is especially important to close within the calendar year, which presents a larger challenge to conferences held late in the year.

Tony Lavietes discussed the conference treasurer web site that is being tested. It will streamline approvals, and also provide back budgets for guidance and comparison. The goal is a system that is seamless with IEEE's financial system and will produce auditable reports effortlessly. Content can be downloaded to Excel and at the moment snapshots can be taken. There are warning flags for large discrepancies between budgeted and actual expenditures. Discrepancies between IEEE and NPSS should be more easily traced. These may relate to glitches in concentration banking that are being investigated and resolved. Some problems arise from how funds are identified (or not) when they are deposited. For conferences outside the U.S. there is also the double currency issue as fluctuating exchange rates. A new IEEE tool will ultimately be required for all IEEE conferences that will track all payments and payouts. Other capabilities of the tool are being defined. There will be more on this in later Newsletters.

Peter Clout, our Division IV Director, commented, along with Steve Gold, on the triennial Sections Congress that was held in San Francisco in August. It gave us good exposure. A major emphasis was on the use of social media such as Facebook and Twitter.

The Board of Directors is considering a membership model change. There may be more news in March, but one concept is a "bundled" membership that includes one society. Many details of the plan haven't been well thought through. The goal is to increase society membership. No exit strategy has been considered in case the plan were to be a failure. Were the plan to be implemented it would cost of order $4.5 to $5 million a year and would require that many things, such as this Newsletter, be available in electronic form only.

Other issues discussed by the Board of Directors were retention of members, the many volunteers, especially in some areas, who are not IEEE members, the different needs of society members versus those who are more involved with chapters and sections.

TECHNICAL COMMITTEE REPORTS

The CANPS executive committee was able to meet in Valencia. The first announcement for the 2012 Real Time conference was planned for release in November. Stefan Ritt visited the venue in August and agreed with the proposal to host the conference dinner at the Berkeley Museum of Art, with meetings and most accommodations in the Hotel Shattuck.

Ingrid Gregor of DESY gave a very nice report on the CIP or Conference Information and Promotion group that works to bring delegates to the NSS/MIC/RTSD meetings. This is a group that originally came together to support the first non North American NSS/MIC that was held in Lyon in 2000 and has provided support as well as conference evaluation through a comprehensive survey for all conferences in this series since. They also maintain an attendee data base. Every conference could use such a group as it is a great way to incorporate younger scientists and get them involved in and known to the community as well as providing an excellent means for an advertising campaign. If your conferences don't have such an activity, maybe you would like to talk with your TC chair and start a CIP!

Both the NSS and MIC conferences, along with RTSD, were quite successful, with high attendance (2025 paid) and excellent papers. There were eight days of sessions and short courses as well as refresher courses.

Planning for both Anaheim in 2012 and for Seoul, Korea (2013), is going well. The 2014 meeting will be held in Seattle and site selection for 2015 is being finalized.

Jose-Manuel Perez, the program chair who ended up taking over for the general chair at the last moment, presented some optimistic financial numbers and also indicated that IEEE attendance was ~40% against 60% non-IEEE members.

The Radiation Instrumentation steering group technically cosponsored the SORMA conference in Oakland, CA in May, as well as the ANIMMA conference held in Ghent, Belgium and the SCINT conference in 2011. In 2012 they are technically cosponsoring PLIM, the IAEA International Conference on Nuclear Plant Life Management. Along with NSMIC they sponsor the NSS/MIC meeting.

The Particle Accelerator Science and Technology committee, chaired by Stan Schriber, is sponsoring the 2012 IPAC to be held in New Orleans, together with the APS DPB. This will be the first U.S.-held IPAC and will replace PAC in this 18-month time frame. The next PAC conference will be held in Pasadena, CA in Sept. 2013.

The Plasma Sciences and Applications TC has some new members, and Christine Coverdale of Sandia has been elected as the new AdCom member. We say farewell to David Abe whose term has seemed too short! PSAC has been updating their web pages, so check them out. Plans for the ICOPS meeting in Edinburgh are well along. The 2013 meeting will be in San Francisco as a PPPS meeting with Bryan Oliver as chair. In 2014 the BEAMS conference will be collocated with ICOPS.

The Radiation Effects TC welcomes Kay Chesnut as its new AdCom member and thanks Jim Schwank for his service. Jim will remain as the liaison to RADECS, a position he shares with Hal Flescher. The 2012 NSREC will be held in Miami, FL, and the 2013 meeting in San Francisco will celebrate NSREC's 50th year, so look for anniversary surprises and special events. The 2014 meeting will be held in Paris.

FUNCTIONAL COMMITTEES

The Conferences chair, Bill Moses, reports that the number of technically cosponsored conferences has risen significantly. If one extrapolates from 2005 to 2010, we can expect two-thirds of our conferences to be technically cosponsored. Is this something IEEE really wants? There are hazards because the conference records aren't always of a quality that reflects IEEE standards and in some cases these 'conferences' have merely been a front to publish a conference record that will appear in Xplore. All TCs technically cosponsoring a conference must have an MOU in place and ensure that the conference does not use the IEEE logo or name before that document is signed and approved.

(continued on page 16)

Scheduling problem

He who is too busy doing good finds no time to be good.

Rabindranath Tagore

Quick, I need a word

Life's disappointments are harder to take when you don't know any swear words.

Bill Waterson (via Calvin Hobbes)

Indecision pays

Patience is sometimes considered a virtue when it is actually a case of not knowing what to do.

Sally Poplin

The road to knowledge

Education: the path from cocky ignorance to miserable uncertainty.

Mark Twain

Taut du jour!

One must live in the present tense, but I have always lived in the present tensely.

Gloria Swanson

(continued from page 15)

More is coming in conference management and reporting software, so stay tuned.

Membership is increasing, despite somewhat less recruiting at some conferences. Changes are still coming to the member recruitment activity. One suggestion is to add IEEE membership level to each badge. Some people like the stick-on badges saying New IEEE Member, New NPSS Member, but others, including some new recruits, don't.

Chapters' chair, Steve Gold, reports 18 active chapters with nine in North America, six in Europe and three in Asia. Chapters are forming in Beijing, Puerto Rico and South Africa. There is now also a Distinguished Lecturers brochure that can be used by Chapters and at conferences.

The Nominations Committee, Craig Woody, chair, used a 45-day balloting period for the 2011 combined AdCom technical committee member elections. This is excellent for people who vote electronically, but can be a problem for international members who prefer a paper ballot. It is also hard to separate who can vote in a particular TC election. The question remains whether these elections should be separated and, if so, how.

Paul Dressendorfer, Publications chair, noted that all our publications are doing well, but there can be a problem in finding things in Xplore, especially in relation to TNS. Some papers are listed in wrong issues /wrong years. Many of the problems have been identified and corrected, but they are continuing to work on it. There are some missing issues as well as some misidentified issues. All IEEE journals in Xplore need to have information verified.

TNS is seeing a slight decline in manuscripts from the radiation instrumentation community, but an increase in radiation effects papers, especially from other communities. Both journals are doing better than IEEE require for review and publication times, however, the time between submittal of a journal issue to IEEE and the actual publication is still too long. Competition from other journals, especially those published electronically, is a potential concern. TNS is also losing medical imaging papers because of the time to publication and because these papers are still not included in PubMed. For members in this field, this listing is important. Perhaps we should resume the attempt to have a TNS A and TNS B, with one focusing exclusively on medical imaging papers. This was rejected the last time due to EMBS objections.

Steve Gitomer, TPS Editor-in-Chief, noted that TPS has delivered 12 issues a year since 2009. In interest of quick publication, they are considering a 'Letters' section. In 2012 they will have twelve special issues.

An all-society, fast-turnaround journal is in the IEEE pipeline. TMI has something called Concise Communications that are less-well reviewed and appear more rapidly.

Peter Clout, Chair of the Communications Committee noted that we have no new literature in the pipeline. Distribution of materials from the IEEE warehouse has worked well. For conferences, make absolutely sure to allow plenty of time and to give Peter (clout@vista-control.com) the names and contact information for people on-site who will receive the materials.

We now have a fair collection of trifold leaflets. Should translated versions be considered?

Ron Keyser reported that two of our standards have been withdrawn, one on multichannel analyzers (1214-1992) and the other on test procedures for geranium crystals for radiation detectors (1160-1993). Technology marches on!

The Transnational Committee welcomes new member Masuharu Nomachi of Osaka University. The committee has raised a question of summer schools in various places to introduce IEEE and our technologies. The Transnational Committee chair, Jean-Luc Leray and the Transnational liaison, Patrick LeDû, will be involved with the many non-North American conferences NPSS is technically cosponsoring.

Dick Kouzes, our Nuclear Power liaison as well as web master, notes that there are several conferences of interest to our community including PLIM, the 2013 ANIMMA conference set for Marseilles, and the NPIC_HMIT conference in San Diego. Power and Energy Society was their sponsor but the 2012 conference is in conflict with the PES general meeting.

Ray Larsen gave an update on the Haiti initiative. The six SunBlazers have been wildly successful and nine more trailers are in production. NPSS has committed to help with brochures and a stand for use at conferences to introduce the project. There is now an IEEE Foundation account to help launch this work in other areas with Africa being the most likely next target, and Latin America to follow.

Peter Clout, ICALEPCS liaison, notes that we need to beef up publicity and so on for our own Real Time conference and review how much support we give to ICALEPCS. We need to get better coordination between these conferences because they are not only conflicting in content more than before, they are also conflicting in geographic meeting location.

Jim Schwank, our RADECS liaison, notes the conference is growing and the number of papers submitted from the 2011 conference in Seville was very high (120 vs. a normal ~80). They are also beginning to hold a more substantial industrial exhibit. In 2012 they will meet in Biarritz and in 2013 in Oxford. Jim has worked on a Conference General Chair and a TNS and Procedures Guide for RADECS! The hope is to develop consistency and information transfer from conference to conference.

Randy Brill remarked that the IEEE-USA's Medical Sciences group had more material of interest to health informatics groups than to NPSS.

The TMI Steering committee met and TMI is doing well. Time to publication is slower than desired but the impact factor is very high and papers are indexed in PubMed. The journal's five-year review in 2011 found no issues. The scope of TMI has become more mathematical and theoretical. There are fewer papers on instrumentation, detectors and data control.

ADCOM ACTIONS

A motion from Radiation Effects concerning their 50th anniversary celebration was tabled.

It was moved, seconded and passed that IEEE NPSS authorize an expenditure of up to $50K in support of the ongoing Haiti work. This money may be spent in either 2011 or 2012.

AdCom will meet in Santa Fe, NM for a retreat on March 2, 2011 and on March 3 for a regular meeting. The summer meeting will be in Edinburgh, Scotland on July 7th prior to the start of the 2012 ICOPS meeting.

Albe Larsen, IEEE NPSS Secretary and Newsletter Editor, can be reached at SLAC National Accelerator Laboratory, MS-64, 2575 Sand Hill Road, Menlo Park, CA 94025; Phone: +1 650 926-4907; Fax: +1 650 726-0368; E-mail: amlarsen@slac.stanford.edu.

On the shoulders of...

As I grow older I realize that I am successful because most people aren't.

Adam Calquhoun

New AdCom Officers and Members

We are pleased to welcome the following elected AdCom Class of 2015 as well as two new Technical Committee chairmen.

Kay Chesnut
AdCom 2015 (RE)

KAY CHESNUT

Radiation Effects

Kay Chesnut is a Chief Engineer with Boeing's Space and Intelligence Systems (S&IS) division. She joined Hughes Space and Communications in 1980 where she designed and implemented timing systems for space applications for both natural and man-made radiation environments. She has developed seminal principles for determining the impacts of single- event effects on multi-GHz RF circuitry used for the clocking of digital systems. Currently, Kay is a Boeing Technical Fellow where she isolates, understands and fixes anomalies both for systems in test and satellites on orbit—her main specialty is troubleshooting and understanding root cause in complex systems including sneak paths and radiation effects. Kay also works extensively in the radiation community; she has served as the IEEE Nuclear and Space Radiation Effects Conference's 2003 Finance Chair, 2005's Local Arrangements Chair, as Secretary for the Radiation Effects Steering Group in 2006, as 2009's Short Course Instructor (with Dr. Kirk Kohnen), and was the Conference Chair for the 2011 NSREC (the first conference chair for this conference from Boeing in over 30 years).

Kay attended her first IEEE Nuclear and Space Radiation Effects Conference (NSREC) in 1993 while investigating digital GaAs circuits that were being deployed in a space-borne digital synthesizer. In one place, she met the whole community associated with radiation's impacts on high-speed digital electronics and they really helped her understand and solve a serious problem. The technical breadth and depth of the discussions at that 1993 NSREC inspired her to keep a close connection with those who make a career in radiation effects. After 17 conferences, she is still inspired by the technical quality of the people and presentations, and the papers published in the *IEEE Transactions on Nuclear Science* (TNS).

Kay Chesnut can be reached via E-mail: kay.c.chesnut@boeing.com.

Christine A. Coverdale
AdCom 2015 (PSA)

CHRISTINE A. COVERDALE

Plasma Science and Applications

Christine A. Coverdale received a Ph.D. in plasma physics in 1995 from the University of California, Davis. Her thesis work was performed at the Lawrence Livermore National Lab in the Laser Program, where she experimentally studied laser-driven instabilities in underdense plasmas.

Upon graduation, she worked at Physics International in San Leandro, CA, in their Plasma Radiation Source (PRS) program developing gas puff Z-pinch sources at long implosion times. She also participated in their diagnostics program, helping to develop X-ray diagnostics for the PRS and Reflex Triode development programs. She joined Sandia National Labs, Albuquerque, NM in October, 1997 as a member of the technical staff. She has been actively engaged in experiments at the Saturn and Z facilities studying long-implosion-time wire array Z-pinches on Saturn, high photon energy Z-pinch sources on Z, deuterium gas puffs for neutron production, and radiation effects tests. She has also participated in Bremstrahlung experiments, diagnostic development, and the use of laser-based plasma sources for radiation-effects testing. For the last several years, she has worked on radiation-detection systems.

Christine has authored or coauthored more than 90 papers and regularly presents at conferences. She is currently a Distinguished Member of the Technical Staff at Sandia National Laboratories. Christine has served three terms on the Executive Committee of the IEEE NPSS Plasma Science and Applications Committee, and was the Technical Program Chair for the IEEE International Conference on Plasma Science (ICOPS) in 2009, 2010, and 2012. She currently serves on the Executive Committee for the APS Division of Plasma Physics, and is the Senior Editor for High Energy Density Physics for the IEEE Transactions on Plasma Science. Christine is a fellow of both the IEEE and the American Physical Society.

Christine Coverdale can be reached via E-mail: cacover@sandia.gov.

MARK T. CRAWFORD

Pulsed Power Science and Technology

Mark Crawford (M'92) received his Ph.D. in electrical engineering from Texas Tech University in 1994. He is currently associate director at the Institute for Advanced Technology (an Army-sponsored University Affiliated Research Center) at The University of Texas at Austin. Dr. Crawford's expertise is in the development and application of pulsed-power systems with specific emphasis on generation of high-power microwaves, intense pulsed ion beams and electromagnetic acceleration. He has been on the technical organizing committees for a number of international conferences including the International Conference on Plasma Science (ICOPS), International Pulsed Power Conference (PPC) and the International Electromagnetic Launch (EML) Symposium. He was cochair of the 2006 EML Symposium in Potsdam, Germany and was awarded the Peter Mark Medal for lifetime contributions to the field of electromagnetic launch at the 2010 EML in Brussels, Belgium. Dr. Crawford is currently the technical chair for the 2013 combined PPC/ICOPS meeting and is general chair for the 2015 PPC. Dr. Crawford guided the transition of the EML Symposium to be a conference sponsored by the Pulsed Power Science and Technology committee of the IEEE NPSS. He also currently serves on the IEEE Marie Sklodowska-Curie Award Committee.

Mark Crawford can be reached via E-mail: mark_crawford@at.utexas.edu.

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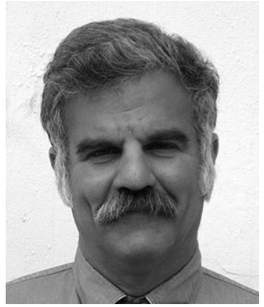
Mark T. Crawford
AdCom 2015 (PPST)



John Sethian
AdCom 2015 (FT)

(continued from page 19)

JOHN SETHIAN

Fusion Technology

John Sethian attended public schools in Arlington County, VA and received an A.B. degree in physics from Princeton University in 1972, and a Ph.D. degree in applied physics from Cornell University in 1976. He has worked at the Naval Research Laboratory (NRL) in Washington, DC ever since. He has performed research on a broad range of topics related to fusion energy: plasma physics, magnetic confinement fusion, electron beam physics, pulsed power, dense z-pinches, cryogenic engineering, inertial confinement fusion, high energy lasers, and inertial fusion energy. He joined the NRL Laser Plasma branch in 1990, and developed the main electron beam pumped amplifier for the Nike KrF laser. In 1999 he started the Electra Laser Program to develop a repetitively pulsed KrF laser that can meet the fusion energy requirements for rep-rate, durability, efficiency and cost. He was the manager of the National High Average Power Laser (HAPL) program since its inception in 2001 to its conclusion in 2009. The HAPL program brought together more than 60 researchers from national laboratories, universities, and private industries to develop the technological underpinnings for practical fusion power based on lasers and the direct drive approach to inertial fusion. Credible technologies and solutions were identified for almost all the key components, and in some cases they were verified in bench tests.

Dr. Sethian is a Fellow of the American Physical Society, has received five NRL invention/technology transfer awards, and has published over 75 archival papers. He has received the Fusion Power Associates Leadership Award as well as the American Nuclear Society's Annual Outstanding Achievement Award.

John Sethian can be reached via E-mail: john.sethian@nrl.navy.mil.

New Technical Committee Chairs

Suleman Surti
Chair, Nuclear Medical and Imaging Technical Committee

SULEMAN SURTI

Nuclear Medical and Imaging Science and Technology

Suleman Surti is an associate professor in the Department of Radiology at the University of Pennsylvania. Suleman received his Ph.D. in Physics at the University of Pennsylvania in 2000 and has been performing research in the area of PET detector/system design and evaluation beginning with his graduate work almost ten years ago. Over this period, he has been actively involved in the development of PET scanners ranging from whole-body through dedicated brain to small-animal imaging. His current research ranges from investigation of new detector and PET system designs, to subsequent evaluation of system performance.

Suleman Surti can be reached at University of Pennsylvania, Department of Radiology, 404 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104 USA; Phone: +1 215-662-7214; Fax: +1 215-573-3880; E-mail: surti@mail.med.upenn.edu

EDWARD J. LAMPO

Radiation Instrumentation Elected Member

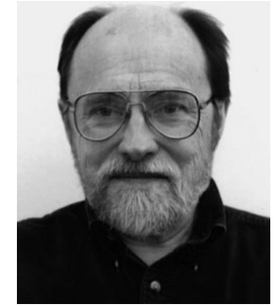
Edward J. Lampo (S'62-M'71-LSrM'10) received the B.S. (1963) and M.S. (1968) in Electronics Engineering and Computer Science from the University of California at Berkeley. He was Staff Scientist—Electronics Engineer (1963-2004) at the University of California, Lawrence Berkeley National Laboratory (LBNL). Ed worked primarily on radiation detector systems and the design of low-noise front ends. His career at LBNL included assignments as Physics Division systems group leader, head of Electronics Department instrumentation and technical support, project engineer for the first time-projection chamber of a SLAC/LBNL collaboration, developer of biomedical electronics, and group leader for environmental instrumentation.

IEEE involvements are centered on the Nuclear and Plasma Sciences Society (NPSS). It all began with the Nuclear Science Symposium (NSS). In 1987, after many years of attending the NSS, Ed took on responsibility for Local Arrangements and has continued in various capacities ever since; General Chairman, Session Leader, Travel Coordinator, Arrangements Chair, Organizing Committee, and Site Selection. From 1992 to 2010 he was NPSS Treasurer and an AdCom member. He served on the Technical Activities Board (TAB) Finance and Society Review Committees. He is a charter member and officer of an IEEE-NPSS chapter in the San Francisco Bay Area.

NPSS serves a vital role as steward of professional standards for a niche that otherwise might not be represented. It takes the breadth and flexibility of an "NSS" to cover the diverse research of the national and international labs. Moreover, the NSS/MIC conference issues of *IEEE Transactions on Nuclear Science* (TNS) provide peer-reviewed archival publication of especially noteworthy presentations.

It is by just such publication that TNS is recognized as having one of the highest numbers of citations and longest shelf retention time of all publications in its field of interest. It is important that these high standards are maintained. To do so requires planning and coordination for the financial as well as the technical success of our meetings and publications. I am honored to represent the Radiation Instrumentation community as an AdCom member and will serve in the best interest of all NPSS members.

Ed Lampo can be reached by phone at +1 925 930-7328 or via E-mail: e.lampo@ieee.org.



Edward J. Lampo
Chair, Radiation Instrumentation Technical Committee

No way!

It is a great evil, as well as misfortune, to be unable to utter a prompt and decided 'No'.

Charles Simons

Suleman Surti
NMIS Technical Committee Chair

Nuclear Medical and Imaging Sciences

It is an honor to assume my duties as chair of NMISC for the next two years starting Jan. 01, 2012. I would like to thank Robert Miyaoka for his excellent work while serving as the chair over the past two years. He will continue to be a part of the NMISC as its Most Recent Past Chair. Dimitris Visvikis was elected as the new NMISC Vice-Chair starting on Jan. 01, 2012 and will take over as Chair at the conclusion of my term. In addition to Robert, I would also like to thank Anna Cellar for all her efforts in serving as the Awards subcommittee chair. Irene Buvat was nominated to succeed Anna, and now takes over as the chair of the Awards subcommittee.

The 2011 IEEE Nuclear Science Symposium and Medical Imaging Conference (IEEE NSS/MIC) was held from October 23-29 in Valencia, Spain. The meeting was led by David Townsend as the General Chair while Alberto Del Guerra and Juan Vaquero served as the MIC Program Chair and Deputy Chair, respectively. A summary of this meeting will be provided elsewhere in the newsletter. In short, there were a total of 2259 registered attendees for the combined meeting. A total of 131 oral papers were presented in 18 MIC and Joint (MIC-NSS and MIC-RTSD) sessions and another 553 abstracts were presented over five poster sessions. In addition, three invited talks presented in two plenary sessions were part of the MIC program. In the student paper competition six oral presentations and eight posters were preselected and evaluated by a five-member committee. Congratulations to Andre Kyme (first place for "Novel SLAM-Based Markerless Motion Tracking of Conscious Unrestrained Rodents in PET"), Kevin Little (second place for "Sinogram Restoration in Computed Tomography with a Non-Quadratic, Edge-Preserving Penalty"), and Thomas Kormoll (third place tie for "A Prototype Compton Camera for In-Vivo Dosimetry of Ion Beam Cancer Irradiation") and Brian Miller (third place tie for "A System Calibration and Fast Iterative Reconstruction Method for Next-Generation SPECT Imagers"). This year's recipients of the Edward J. Hoffman Medical Imaging Scientist and the Bruce Hasegawa Medical Imaging Conference Young Investigator Awards were Dr. Michel Defrise of Vrije Universiteit and Dr. Abhijeet J. Chaudhari of UC Davis Medical Center, respectively. Dr. Defrise received his award ***For pivotal contributions to the science of tomographic reconstruction.*** Dr. Chaudhary received his award ***For contributions to the fields of multispectral optical tomography, PET instrumentation, and translational molecular imaging.*** At the conference Dr. Harrison H. Barrett was also recognized as the recipient of the 2011 IEEE Medal for Innovation in Healthcare Technology. Dr. Barrett was awarded the medal ***For pioneering contributions to the foundations and applications of biomedical imaging science.***

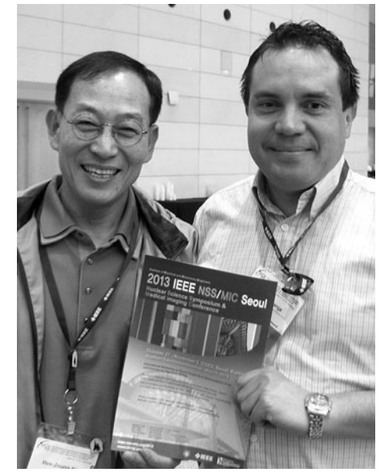
If you know someone who would make a good recipient for either of the NMISTC awards please take the effort to nominate them (deadline for nominations is 15 July). Information about the NMISTC awards and additional NPSS-level awards can be found on the NMISC web site (http://ewh.ieee.org/soc/nps/nmisc/MICAwards.html).

The preparations for the 2012 IEEE NSS/MIC meeting are moving along well. The meeting will take place at the Disneyland Hotel Convention Center in Anaheim, CA from Oct. 29th-Nov. 3rd and will be led by Tom Lewellen as the General Chair. Vesna Sossi will serve as the MIC Program Chair while Alex Converse will be the MIC Deputy Program Chair. The 2013 meeting will take place at the Coex Convention Center in Seoul South Korea. Hee-Joung Kim is the General Chair for the meeting and Jae Sung Lee is the MIC Program Chair. The 2013 meeting planning committee met at this past year's IEEE NSS/MIC meeting and is making continued progress on the event organization. In 2014, the IEEE NSS/MIC meeting will take place in Seattle, WA with Tony Lavietes as the General Chair for the meeting. Georges El Fakhri and Katia Parodi will serve as the MIC Program Chair and Deputy Program Chair, respectively. For the 2015 meeting site, Liverpool, England is currently the strongest applicant to serve as the host, but the site has not been finalized.

At the NMISC annual meeting in Valencia, five new Council members were elected to serve for a three-year term beginning January 01, 2012. The new Council members are Michael King, Paul Marsden, Uwe Pietrzyk, R. Glenn Wells, and Larry Zeng. I would like to thank them for volunteering their time to serve the NMISTC membership. Also, Ralf Engels will be taking over from Tom Lewellen as Chair of the Joint Oversight subcommittee for RISC and NMISC which is responsible for site selection for future IEEE NSS/MIC meetings. If you are interested in becoming more involved in the oversight of the MIC meeting please consider running for an NMISC council position. Five individuals are elected each year for a three-year term. For more information please go to the NMISC webpage (http://ewh.ieee.org/soc/nps/nmisc/).

As part of its Constitution, the NMISC is required to review the NMISC Constitution and By-Laws every five years. This review was last performed in 2007 and a five-member subcommittee has been formed to undertake this task once again in 2012. In addition, at the AdCom meeting in Valencia, all Technical Chairs were asked to revise their Bylaws to reflect the change within NPSS AdCom that reduced the waiting period for counting ballots for AdCom elections from 60 days to 45 days. AdCom would like the waiting period to be the same between AdCom elections and Technical Committee elections. A benefit of reducing the waiting period to 45 days is that it allows us to know the results of our elections before the annual NMISC meeting. Consequently previous wording of By-law 2.7, "2.7 Sixty days after distribution of the ballots, the IEEE Headquarters shall count and tabulate the votes received and report the results to NMISC" was changed to "2.7 Forty-five days after distribution of the ballots, the IEEE Headquarters shall count and tabulate the votes received and report the results to NMISC." In addition, Bylaw 2.3, as previously worded "2.3 If there are more nominations than posts to be filled, those nominees receiving the highest number of votes will be elected to the vacant posts" did not make sense given the revision made to our Bylaws last year requiring at least 1.5 candidates for each vacant committee position. It has therefore been changed to "2.3 Nominees receiving the highest number of votes will be elected to the vacant posts." These amendments were voted on and approved by NMISC and AdCom. The amended NMISTC Constitution and Bylaws is published in this newsletter. Much thanks goes to Robert for getting this approval done in time for this newsletter publication.

Suleman Surti can be reached at University of Pennsylvania, Department of Radiology, 404 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104 USA; Phone: +1 215-662-7214; Fax: +1 215-573-3880; E-mail: surti@mail.med.upenn.edu



Hee-Joung Kim and Jae Sung Lee show off flyer for NSS/MIC 2013 in Valencia.

Righteous cloak

Every nation makes decisions based on self-interest and then defends them in the name of morality.

William Sloane Coffin Jr.

With strings attached

There is no smaller package in all the world than that of a man all wrapped up in himself.

William Sloane Coffin Jr.

Constitution and Bylaws of the Nuclear Medical and Imaging Sciences Technical Committee of the IEEE Nuclear and Plasma Sciences Society

Article I—Name and Object

Section 1. The organization shall be known as the Nuclear Medical and Imaging Sciences Technical Committee of the IEEE Nuclear and Plasma Sciences Society (NPSS), hereafter referred to as the Committee.

Section 2. The Committee shall strive for the advancement of theories and applications of Nuclear Medical and Imaging Sciences and of its allied arts and sciences and maintenance of high scientific and technical standards among its members.

Section 3. The Committee shall aid in promoting close cooperation and exchange of technical information among its members and to this end shall hold meetings for the presentation and discussion of original contributions, shall assist in the publication of the Transactions on Nuclear Science (TNS) and other IEEE publications that the committee shall deem appropriate, and shall otherwise provide for the needs of its members.

Article II—Field of Interest

Section 1. The field of interest of the Committee is Nuclear Medical and Imaging Sciences, and their related technologies and applications. It shall foster publication or other dissemination of original contributions to the theories, experiments, educational methods and applications of Nuclear Medical and Imaging Sciences. Areas of technical activity will include, but not be limited to the following:

Section 2.

1) Radiation sources (including synchrotron radiation)

2) Detectors used for imaging and radiotherapy

3) Radiation standards and radiation monitoring for biomedical instrumentation and personnel

4) Theory, physics and instrumentation of medical imaging modalities including, but not restricted to:

a. Planar Nuclear Medicine (NM)

b. Single Photon Emission Computed Tomography (SPECT)

c. Positron Emission Tomography (PET)

d. Magnetic Resonance Imaging (MRI)

e. Magnetic Resonance Spectroscopy (MRS)

f. Magnetic Resonance Angiography (MRA)

g. Functional MRI (fMRI)

h. X-ray Computed Tomography (CT)

i. Digital Radiography (DR)

j. Related imaging systems and devices

5) Modeling and simulation of imaging detectors, devices, systems, and processes

6) Image analysis techniques

7) Image reconstruction algorithms

8) Quantitative imaging methods

Article III—Membership

Section 1. Members of the Committee are members of the IEEE NPSS having an interest in Nuclear Medical Imaging.

Section 2. Affiliates may participate in the activities of the Society as provided by the IEEE Bylaws and subject to the applicable IEEE rules and regulations and to any additional limitations imposed by the Society Bylaws.

Article IV—Administration

Section 1. The Committee shall be managed by a Nuclear Medical and Imaging Sciences Council (NMISC) consisting of elected members-at-large, plus certain ex-officio members as specified herein and in the Bylaws. The number of elected members-at-large shall be 15 members.

Section 2. The terms of office of the elected members-at-large shall be three years. Members-at-large elected to a full term may not succeed themselves, and at least one year must elapse before an individual may be re-elected to the NMISC. Election of members-at-large shall be held annually to fill vacancies for the coming year. The terms of office of the ex-officio members shall be specified in the Bylaws.

Section 3.

(a) The affairs of the Committee shall be managed by a Chairperson, as directed by the NMISC and in accordance with the powers and duties as defined thereunder and in the Bylaws. In the event of the Chairperson's absence or incapacity, his/her duties shall be performed by a Vice-Chairperson.

(b) The Chairperson shall appoint a Secretary for the NMISC. The Secretary need not be chosen from among the elected members at large.

Section 4.

(a) On alternate years a Vice-Chairperson (who shall be the Chairperson elect) is elected by the voting members of the NMISC from the eligible members-at-large of the NMISC. The term of office for the Vice-Chairperson shall be two years as Vice-Chairperson, followed by two years as Chairperson, and two years as the Most Recent Past Chairperson.

(b) Only those members-at-large having one year or more of their term as elected member-at-large remaining shall be eligible for election as Vice-Chairperson. In the event that a Vice-Chairperson is elected to take office at the beginning of the second or third year of their term as member-at-large, said term shall automatically extend until he vacates the office of Most Recent Past Chairperson. During this extension, that individual shall be considered an ex officio member with voting rights. No individual may serve two successive terms as Vice-Chairperson or two successive terms as Chairperson.

(c) In the event that neither the Chairperson or the Vice-Chairperson is able to take office as prescribed in the Bylaws, or if both are incapacitated or if both offices become vacant, the NMISC shall promptly elect an Acting Chairperson from among the members-at-large to assume the duties of Chairperson until either a Chairperson or Vice-Chairperson takes office or resumes their duties.

(d) The Vice-Chairperson will, except under circumstances deemed unusual by a majority of the voting members of NMISC, become the sole nominee for the succeeding Chairperson election.

Section 5. The Chairperson shall be an ex-officio member of all sub-committees of the NMISC.

Section 6. The Chairperson, as soon as expedient after their election, shall appoint the Chairpersons of the sub-committees provided for in the Bylaws.

Article V—Nominations and Election of NMISC Members-at-Large

Section 1. Nominating procedures shall be as prescribed in the Bylaws and shall include provision for nomination by NMISTC members.

Section 2. Election of the members-at-large of the NMISC shall be as prescribed in the Bylaws.

Section 3. If a member of the NMISC does not complete their term, the NMISC Chairperson shall appoint a replacement to fill the unexpired portion of the term. When an NMISC member is appointed for a partial term, that person is eligible to run for the next full-term election to the same position.

Article VI—Meetings

Section 1. The Committee may hold meetings, conferences, symposia or conventions either alone or in cooperation with other organizations subject to applicable IEEE and NPSS rules and regulations.

Section 2. Eight voting members of the NMISC shall constitute a quorum. No member shall have more than one vote by reason of multiple offices or Committee responsibilities.

Section 3. A majority of the legal votes cast by those members of the NMISC attending a meeting shall be necessary for the conduct of its business except as otherwise provided in this constitution.

Section 4. Business of the NMISC may be handled by any written means which includes (but is not limited to) correspondence, fax or e-mail if, in the opinion of the Chairperson, matters requiring prompt action can be adequately handled in that manner. A majority of the voting members of NMISC is required to take action in such a case. Such actions are to be promptly confirmed in writing by the Chairperson to NMISC.

Section 5. The NMISC shall meet as required to conduct business and in accordance with the Bylaws.

Article VII—Amendments

Section 1. Amendments to this Constitution may be initiated by petition submitted by a two-thirds vote of the NMISC, such petition being submitted to the Ad Com of the NPSS for approval. After such approval, the proposed amendment shall be publicized in the IEEE TNS or Medical Imaging (TMI), and/or the NPSS Newsletter, with notice that it goes into effect unless 20 Committee members object within 90 days of the date of mailing of the notice. If such objections are received, a copy of the proposed amendment shall be mailed with a ballot to all members of the Committee at least 30 days before the date set for the return of the ballots; the ballots shall carry a statement of the deadline for their return to the IEEE office. When a mail vote of the entire Committee membership is made necessary, approval of the amendment by at least two-thirds of the ballots returned shall be necessary for its enactment.

Section 2. As an alternative to the procedure outlined in Section 1 above, 10 members of the Committee may submit a petition to the Ad Com of the NPSS. If approved by the NPSS Ad Com and after notification of the NMISC, the proposed amendment shall be submitted to the membership by mail ballot as described above.

Section 3. Committee Bylaws, and amendments thereto, may be adopted by two-thirds vote of the NMISC, provided that notice of the proposed Bylaw or amendment has been sent to each member of the NMISC at least a week prior to such meeting. Alternatively, a Committee Bylaw or amendment may be adopted by a two-thirds mail vote of the members of the NMISC, provided a 30-day period is provided for such responses. In either event, the proposed Bylaw or amendment shall be publicized in the NPSS TNS or TMI, and/or the NPSS Newsletter. No Bylaw or amendment shall take effect until it has been approved by the Ad Com of the NPSS.

Article VIII—Revision

Section 1. The Chairperson of the NMISC shall appoint a five-person sub-committee no later than January 1, 2007, and every five years hence to evaluate the effectiveness of this Constitution and Bylaws, to study the rules of governance required by the activities of the Committee at that time, and to consider writing a new Constitution and Bylaws appropriate to the existing and anticipated needs of the NMISC.

BYLAWS

1. NMISC: Article IV of the Constitution provides that the NMISC shall consist of a number of elected members-at-large plus certain ex-officio members. The ex-officio members of the NMISC shall be (unless they are already elected members-at-large), the Chairpersons of the Functional Sub-Committees, the Chairperson of the Radiation Instrumentation Technical Committee, the Secretary, the Editors and Associate Editors of the IEEE TNS and other publications as deemed appropriate by the NMISC and such other ex-officio members as are provided for in the Constitution and Bylaws of the NPSS.

1.1. The voting members of the NMISC shall be the elected members-at-large, the Chairperson, Vice-Chairperson, and Most Recent Past Chairperson.

1.2. The NMISC shall meet at least once per year, upon dates determined by the Chairperson at least three weeks in advance of the meeting. Additional meetings may be called at the discretion of the Chairperson or upon request of at least eight voting members of the NMISC with at least three weeks notice.

1.3. The last regularly scheduled meeting in the calendar year shall be considered the Annual Meeting of the NMISC.

1.4. The Annual Meeting of the NMISC will be open to all Committee members.

2. Nomination and Election of NMISC Members: Articles IV & V of the Constitution specify the number of NMISC members-at-large, as well as the term length and restrictions. One third of the NMISC members-at-large posts are to be filled each year by election of the general membership of the Committee.

2.1. The Chairperson of the NMISC is responsible for ensuring that the number of nominations is no less than one and a half times the number of vacant posts (e.g., a minimum of eight nominations are required for five open committee positions) . Nominations may be made by any member of the NMISC or any member in good standing of the Committee. Self nominations are allowed.

2.2. The Individual making a nomination must determine in advance that the nominee is willing to serve if elected.

2.3. Nominees receiving the highest number of votes will be elected to the vacant posts.

2.4. The Chairperson of the NMISC shall assure, before April 1, that a call for nominations is conveyed to the whole membership. Additional nominations may be submitted to the nominating committee by July 1 by members of the Committee or by members of the NMISC. Such nominations must include an expression by the nominee of willingness to serve if elected.

2.5. All nominees must be either members in any grade of IEEE and of the Nuclear Medical and Imaging Science Technical Committee or must have submitted applications for membership at the time the nominations are forwarded to IEEE Headquarters.

2.6. The Secretary shall annually arrange for the distribution to the members of the Committee on or about July 31, a ballot to elect the candidates to fill vacancies on the NMISC. The ballot shall

(continued on page 26)

(continued from page 25)

be accompanied by a short biographical sketch of each nominee with an indication of their Nuclear Medical and Imaging Science activities and former or present IEEE activities.

2.7. Forty-five days after distribution of the ballots, the IEEE Headquarters shall count and tabulate the votes received and report the results to the NMISC.

2.8. The NMISC shall submit to the Secretary of the NPSS Ad Com the names of the candidates with the largest number of votes to fill the designated vacancies.

3. Functional Committees: The Chairperson of the Committee, in concurrence with the NMISC, shall appoint the Chairpersons of the following Functional Sub-Committees:

-A Fellows and Awards Sub-Committee.

-Other Sub-Committees as shall be required for the operation of the Committee.

3.1. The term of office of a Chairperson of a Functional Sub-Committee shall be one year, but a Functional Sub-Committee Chairperson may be re-appointed to the same position.

3.2. The Chairpersons of Functional Sub-Committees must be members of the NMISC.

3.3. The membership of the Functional Sub-Committees shall be appointed by the Chairperson of that Functional Sub-Committee. The membership and activities of the Functional Sub-Committees should be publicized to the membership of the Committee via the NPSS Newsletter, and suggestions for Sub-Committee membership should be invited from Committee members.

3.4. Each of the Functional Sub-Committees shall submit a written report of its activities to the NMISC prior to or at the Annual Meeting.

3.5. The Nuclear Science Symposium and Medical Imaging Conference Oversight Subcommittee shall be a Joint Subcommittee of the RISC and NMISC. Its Chairperson shall be appointed by a Joint Executive Subcommittee of the RISC and NMISC consisting of the current Chairpersons, the Most Recent Past Chairpersons, and Vice Chairpersons of the RISC and NMISC. The Chairperson of the Oversight Subcommittee must be a member of either the RITC or the NMISTC. The Chairperson of the Oversight Subcommittee shall appoint the committee's membership, subject to the approval of the Joint Executive Subcommittee. The charge of the Oversight Subcommittee shall be to provide for the continuation and long term planning of the NSS/MIC conference, including the selection of the sites and General Chairpersons of future conferences. The General Chair of a given year's conference shall, in consultation with the Oversight Subcommittee, the RISC and the NMISC, also select the NSS Program Chair and MIC Program Chair for that year's conference. The term of office of the Chairperson of the Oversight Subcommittee shall be one year, but the Chairperson may be re-appointed to the same position.

4. Ballots: All ballots, whether for purposes of election or changes in the Constitution, shall be issued to the voting members by the Secretary pursuant to action by the NMISC. No ballot shall be counted unless unambiguously marked by a qualified voter to indicate their choice, and sent in a sealed envelope bearing the voter's name on or before the specified deadline date. This specified deadline date shall be at least thirty days subsequent to the date of the mailing of the ballots. The distribution and counting of the ballots shall be entrusted to IEEE Headquarters. The IEEE Headquarters will report the results of the election to the Secretary of NMISC, in turn, shall report the results to the NMISC.

5. Beginning of Terms of Office: All terms of office of elected Members-at-Large of the NMISC shall begin January 1 of the year immediately following their election.

6. Election of the Vice-Chairperson of NMISC: The Vice-Chairperson of NMISC shall be nominated and elected from among the eligible members-at-large of the NMISC. A minimum of one month before the annual meeting of the NMISC, the NMISC Secretary will notify all current NMISC members of the upcoming election and solicit nominations (self-nominations are allowed). The nominations will be closed two weeks before the annual meeting of the NMISC, and the Chairperson of the NMISC is responsible for ensuring that at least one nomination for Vice-Chairperson is received by this time. The Secretary of NMISC shall announce to all voting NMISC members-at-large the identities of the candidates at least one week before the annual meeting, and also inform them of the procedure for casting a ballot if they are unable to attend the NMISC annual meeting. The vote will occur during the annual meeting of the NMISC. If there is only one candidate, then that candidate will be elected at the Annual Meeting by those NMISC members in attendance. If there is more than one candidate, a secret ballot will be taken during the annual meeting and the Chairperson shall designate tellers to immediately count the ballots. Voting NMISC members-at-large who are not attending the annual meeting of the NMISC may submit a ballot by notifying the NMISC Secretary of their choice. The results of the vote shall be announced and the nominee receiving a majority of votes cast shall be declared elected. In the event that no candidate receives a majority of votes cast, runoff elections shall be conducted by secret ballot at the Annual meeting of NMISC among the candidates receiving the two highest number of votes until one candidate receives a majority of the votes cast. For these runoff elections, only those NMISC members in attendance may cast a vote.

7. Records: The secretary shall maintain a permanent record of all non-routine motions passed by the NMISC, written minutes of the Annual Meeting of the NMISC, a roster of all NMISC members, and a membership roster of all NMISC sub-committees. The secretary must provide a tabulation of the most recent five years of motions and a copy of the NMISTC constitution and bylaws to each newly elected member-at-large to the NMISC.

8. Alternates:

8.1. Members-at-Large: An elected Member-at-Large may designate any member in good standing of the NMISTC to represent the Member-at-Large at the NMISC meeting. The representative shall have the privilege of the floor, but may not vote on any matters coming before the NMISC.

8.2. AdCom Representation: If the NMISC Chairperson is unable to represent the NMISC at the NPSS AdCom, the Chairperson may designate the Vice-Chairperson or the Most Recent Past Chairperson as his/her alternate. This alternate has the privilege of the floor and may vote on all matters coming before AdCom.

Revised December 20, 2012.

Plasma Science and Applications

Brendan B. Godfrey
Chair, PSA Technical Committee

PSAC ExCom and AdCom Add New Members—Class of 2012

The PSAC ExCom and AdCom election results from this past fall's election are now official. The NPSS Plasma Science and Applications Committee (PSAC) is managed by an Executive Committee (ExCom), consisting of eighteen members directly elected by the overall membership of PSAC and of the officers whom they, in turn, select. Elected PSAC members hold office for three years. Six members are selected each year. The members elected this past fall are David Abe, Farhat Beg, Robert Jackson, Michael Mazarakis, Donald Shiffler, and Mary Ann Sweeney. Outgoing members are David Cartwright, Robert Commisso, Simon Cooke, Christine Coverdale, Michael Kong, Baruch Levush and David Abe (AdCom 2011).

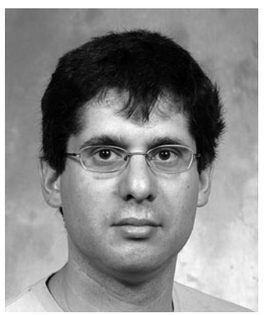
The nomination call for this year's election now is open and will remain so until 1 June 2012. Interested PSAC members are encouraged to nominate themselves or others by sending an email to Steven Gold, PSAC Secretary, at steven.gold@nrl.navy.mil, with a copy to Brendan Godfrey, PSAC Chair, at brendan.godfrey@ieee.org. GOLD members and members living outside North America are especially encouraged to apply. Current ExCom membership and other information is provided at http://ewh.ieee.org/soc/nps/tc-psac.html

The IEEE Nuclear and Plasma Sciences Society (NPSS) is the parent organization of PSAC. NPSS is managed by an Administrative Committee (AdCom). PSAC has four members on AdCom: the PSAC ExCom Chair and three directly elected members. AdCom members are expected to attend three AdCom meetings per year (typically, one for two days and two for one day each) and often serve on subcommittees as well. Elected members serve for four years. Christine Coverdale was elected this fall as a PSAC representative to the NPSS AdCom.

It should be noted that the elected members for both ExCom and AdCom were selected from an excellent pool of qualified candidates. For each position, there were at least two able candidates, exceeding the 1.5:1 IEEE election criterion.

Brendan Godfrey, Chair of the Plasma Science and Applications Technical Committee, can be reached via E:mail: brendan.godfrey@ieee.org.

Boaz Rubenstein is This Year's PSAC Student Award Winner



Boaz Rubenstein
2012 PSAC Student Award Winner

Each year since 2008, PSAC has selected from a pool of exceptional nominees an Outstanding Student in Plasma Science. The award recognizes outstanding contributions to plasma science made by the successful candidate, who at the time of the nomination must be a full-time university undergraduate or graduate student. Nominees are judged on the following criteria: 1) quality of research contributions, 2) quality of educational accomplishments, and 3) quality and significance of publications and patents. The prestigious award is presented to the winner at the ICOPS meeting

(continued on page 28

The precious few

Some persons are likeable in spite of their unswerving integrity.

Don Marquis

(continued from page 27)

following the official announcement. The award itself consists of a $1000 cash prize and an elegant certificate of award. Additional details on the award itself may be found at the link http://ewh.ieee.org/soc/nps/PSACstudentAward.htm or by contacting the PSAC Awards Chair, Chris Deeney directly at chris.deeney@nnsa.doe.gov.

This year's award winner is graduate student Boaz Rubenstein of the Weizmann Institute of Science. Boaz is being recognized for his important contributions to the development of spectroscopic diagnostics and the subsequent interpretation of such measurements to understanding the fundamentals of magnetic-field penetration of nearly collisionless plasmas. Such research is of particular importance with applicability ranging from astrophysical plasmas to pulsed-power applications. More specifically, Boaz Rubenstein's thesis research may be summarized as follows:

1. Developed an indirect approach to measure magnetic fields in plasmas with high-sensitivity and with an unprecedented ultra-high spatial resolution.
2. Developed spectroscopic techniques for obtaining submillimeter spatial resolution along the line-of-sight.
3. Determined in detail the magnetic-field profile propagation in a plasma.
4. Used the magnetic-field profile to determine the conductivity of the nearly-collisionless plasma.
5. Measured the magnetic-field propagation rate and showed it propagates in the plasma as a wave. The first experimental proof of the prediction of the Hall-field-induced magnetic-field penetration theory.
6. Obtained high-resolution (submillimeter scale) density evolution in plasma under pulsed magnetic fields and showed a sharp density peak due to ion reflection by the propagating magnetic-field front.
7. Revealed small-scale (~ mm) structure in the magnetic-field front propagating in nearly collisionless plasma using the spatial distribution of a spectral line intensity that is shown to be correlated with the field magnitude.
8. Estimated the magnetic-field energy dissipation during the field penetration into the plasma

Academically, Boaz was also an exceptional student. Indeed in 2011, he received The Israel Plasma Science & Technology Association Prize for his conference paper: "Highly Resolved Spectroscopic Observation of Magnetic Field Penetration into an (almost) Collisionless Plasma." His publication record is exemplary and includes many conference papers and a number of manuscript submissions based directly on his thesis work.

Marital insight

May you have a wife who doesn't believe what she sees.

Paul Valéry

Pulsed Power Science and Technology

In the recent past, the Pulsed Power Science and Technology (PPST) changed its service dates to coincide with the Nuclear and Plasma Sciences Society so that terms of service start with the calendar year. During the last year, we encouraged self nominations for candidates to serve on the PPST Committee. I am pleased to announce that Dr. Brent McHale, Dr. Bryan Oliver and Professor David Wetz have been chosen to serve! By way of introduction, I am presenting brief biographies of our new members:

Dr. Brent McHale is a researcher at Lawrence Livermore National Lab (LLNL). His areas of expertise are in the fields of power electronics, power systems and pulsed power systems. He has worked at LLNL for the last 5 years on a range of programs and projects. One of the most notable is the National Ignition Facility (NIF), which is a joint effort of a number of national labs and universities in fusion research and high energy density physics. NIF is not only one of the world's biggest and highest energy lasers it is also one of the largest pulsed- power systems. On NIF he is the lead engineer on the Plasma Electrode Pockels Cell (PEPC) which is one of the key enabling technologies for NIF. Although lower energy than the laser-driven pulsed-power systems, PEPC makes up for it in complexity with nearly 500 independent high-voltage supplies and over 500 optical triggers. Prior to joining LLNL he received his Ph.D. from Texas Tech University while working at the Center for Pulsed Power and Power Electronics. He is also extremely active with IEEE and has served as Chair and Vice-chair of the Oakland East Bay section of IEEE, Chair of the San Francisco Bay Area Council, and founding Chair and Vice-chair of a local chapter of Graduates of the Last Decade.

Dr. David Wetz was born in El Paso, Texas in 1982. He received the B.S. degrees in Electrical Engineering and Computer Science from Texas Tech University in 2003. He also earned the M.S. and Ph.D. degrees in Electrical Engineering from Texas Tech University in 2004 and 2006 respectively. During his tenure at Texas Tech, he worked as an undergraduate and graduate Research Assistant in the Center for Pulsed Power and Power Electronics where his research was focused in the areas of pulsed-power system design, pulsed dielectric breakdown of liquids, and ion thruster optimization. He was recognized as the IEEE 2006 Pulsed Power Student of the Year. Upon graduation in 2006, he became a member of the research staff at the Institute for Advanced Technology (IAT) at the University of Texas at Austin as a Postdoctoral Fellow and later as a Research Associate. While employed there, his work was focused on advancing the development of electromagnetic launch systems. In 2008 he was recognized as an Outstanding Young Researcher at the 2nd Euro Asian Pulsed Power Conference in Vilnius, Lithuania. In August of 2010, he joined the faculty of the Electrical Engineering Department at the University of Texas at Arlington as an Assistant Professor. Since joining UTA, his research has been focused in the areas of pulsed power, MicroGrid design and optimization, and understanding the limitations of using electrochemical energy storage devices in pulsed-power systems.

Bryan should already be a familiar name since he served as the Technical Program Chair for the 2011 International Pulsed Power Conference and is the Chair of PPPS 2013—a combined meeting of the Pulsed Power Conference and the International Conference on Plasma Science (ICOPS). PPPS 2013 will be organized by the Pulsed Power Science and Technology Committee as well as the Plasma Science and Applications Committee. PPPS 2013 will be held in San Francisco's Hyatt Regency, June 16-22, 2013. Self nomination forms can be obtained from the Pulsed Power Technical Committee website and are welcomed throughout the year.

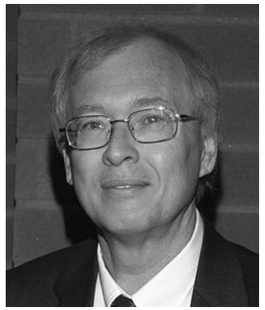
Jane Lehr can be reached at Sandia National Laboratories, Exploratory Pulsed Power Department, PO Box 5800, Albuquerque New Mexico, 87185-1152, US; Phone:+1 505 844 8554; E-mail: jmlehr@sandia.gov.

Jane Lehr
Chair, Pulsed Power Technical Committee

No detours allowed

Everybody's honest in one way or another. The trouble is that there is only one official way.

Jean Anouth



Dan Fleetwood
Radiation Effects Technical Chair

Teresa Farris
Radiation Effects Vice Chair, Publicity

Radiation Effects

Outstanding Papers at the 2011 Nuclear and Space Radiation Effects Conference.

Outstanding Conference Paper:

Variable Depth Bragg Peak Method for Single Event Effects Testing, *S. Buchner, N. Kanyogoro, D. McMorrow, C. Foster, P. O'Neill, and K. Nguyen*

Outstanding Student Paper Award:

TID versus DDD Induced Random Telegraph Signal in CMOS Image Sensors, *C. Virmontois, V. Goiffon, P. Magnan, S. Girard, O. Saint-Pe, S. Petit, and G. Rolland*

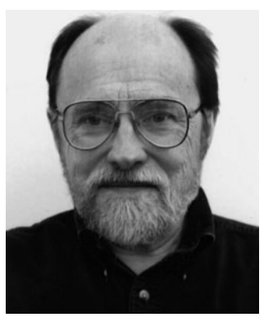
Outstanding Data Workshop Presentation:

SEU and MBU Angular Dependence of Samsung and Micron 8Gb SLC NAND-Flash Memories under Heavy-Ion Irradiation, *K. Gruermann, D. Walter, M. Herrmann, F. Gliem, H. Kettunenand, and V. Ferlet-Cavrois*

Preliminary information on the 2012 NSREC can be found in the CONFERENCES section, and details of the 2011 conference appeared in the December 2011 Newsletter.

Dan Fleetwood, Chair of the Radiation Effects Technical Committee, can be reached at Vanderbilt University, Department of Electrical Engineering and Computer Science, P.O. Box 92, Station B, Nashville, TN 37235; Phone: +1 615 322-2771; Fax: +1 615 343-6702; E-mail: Dan.Fleetwood@vanderbilt.edu.

Teresa Farris can be reached via E:mail: Teresa.Farris@aeroflex.com



Edward J. Lampo
RISC Chair

Radiation Instrumentation

It is a pleasure to introduce and congratulate the most recent Radiation Instrumentation Steering Committee (RISC) members: Etienne Auffray, Ralf Engels, Dick Lanza, Maxim Titov, and Gary Varner. Each was elected for a three-year term (2012-2014)—they join present RISC members: Gyuseong Cho, Patrick LeDû, Dora Merelli, Jose-Manuel Perez, Graham Smith, Bill Moses, Ralph James, Ingrid-Maria Gregor, Susanne Kuehn, and Anatoly Rosenfeld. The RISC members have selected as RISC officers for 2012-2014: Tony Lavietes, Vice-Chair; Chuck Melcher, Past-Chair; and Ed Lampo, Chair. Brad Roscoe has agreed to be RISC Secretary for 2012. Thank you to outgoing RISC members: Christian Bohm, Roger Gearhart, Dick Kouzes, and Barbara Obryk for their three years of service.

The primary purpose of RISC is to ensure the ongoing excellence of the annual Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC). The NSS has long been the meeting of choice for many in our profession—and has been so for more than 50 years! In 2011 the NSS/MIC was held in Valencia, Spain. For the entire NSS/MIC and Room Temperature Detector Symposium, there were 1,841 abstract submittals, with NSS accounting for 836 of these. Overall there were submissions of approximately 790 abstracts from Europe, 530 from U.S., and 520 from other countries. For many years, the NSS has been a transnational meeting as measured by attendance, abstract submittals, and since the year 2000, also by location. The non-North American meetings have been Lyon, France in 2000; Rome, Italy in 2004; Dresden, Germany in 2008; and Valencia, Spain in 2011. The schedule of upcoming NSS meetings is: 2012—Anaheim, California; 2013—Seoul, Korea; 2014—Seattle, Washington.

Ed Lampo, RISC Chair, can be reached via E-mail at e.lampo@ieee.org

Radiation Instrumentation Awards

Andrew Goertzen
Radiation Instrumentation Early Career Award recipient

RADIATION INSTRUMENTATION EARLY CAREER AWARD

Andrew Goertzen

This highly selective award is given to a young investigator (within 10 years of receiving the Ph.D.) in recognition of significant and innovative technical contributions to the fields of radiation instrumentation and measurement techniques for ionizing radiation. The prize consists of $1,500 and an engraved plaque.

Our recipient is an Assistant Professor of Radiology at the University of Manitoba and a clinical nuclear medicine physicist at Health Sciences Centre in Winnipeg, Canada. He received his Ph.D. in Biomedical Physics from the University of California, Los Angeles in 2003. Following his Ph.D. work, he has demonstrated his ability to publish and obtain grants while moving through several positions as a post-doc and early career professor, while collaborating with many people in the field, both students and well-known experts. This open, collaborative nature is a great example of how to bring together different talents to address a particular problem. Upon returning to Winnipeg he successfully put together an entire imaging center, including clinical, preclinical, radiochemistry and cyclotron facilities.

An example of his work is his recently accepted paper on examining the effects of single and multiple detector failures for PET scanners. He selectively removed data from various combinations of detectors to realistically simulate the effects of actual failures and then created images for radiologists to review. What he found was that instead of sending patients away and cancelling scans, in many cases it is quite acceptable to go ahead and image the patients. This will result in better and more timely patient care.

Our recipient has built a very good publication list, publishing in the top journals in our field such as *IEEE Transactions on Medical Imaging*, *Medical Physics* and *Physics in Medicine and Biology*, with citations that exceed 300. He is gaining international recognition in the field, for example through invitations to review for top journals, grant review panels, invited talks and serves as an Associate Editor for the journal Medical Physics.

Citation: For contributions to molecular imaging instrumentation, in particular the development and improved utilization of both clinical and preclinical PET and CT imaging systems.

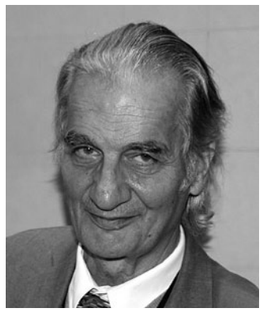
Andrew Goertzen can be reached by E-mail: goertzen@bic.mni.mcgill.ca

(continued on page 32)

Non-reciprocity

All great truths begin as blasphemies, but all blasphemies do not become great truths.

George Bernard Shaw



Gerhard Lutz
Radiation Instrumentation Outstanding Achievement Award recipient

(continued from page 31)

RADIATION INSTRUMENTATION OUTSTANDING ACHIEVEMENT AWARD

Gerhard Lutz

This highly selective award is given to an individual in recognition of outstanding and enduring contributions to the field of radiation instrumentation. The prize consists of $3,000 and an engraved plaque.

Our recipient spent 32 years as a staff scientist at the Max Planck Institute of Physics in Munich, Germany. He is currently is senior scientist at PNSensor GmbH and former head of the MPI Semiconductor Laboratory. His scientific career spreads over a wide range of fields in physics and electrical engineering, beginning in 1967 with an award-winning Ph.D. thesis at DESY where he produced highly polarized (<70%) coherent Bremsstrahlung on a diamond target.

He took part in several particle experiments at BNL and CERN. The BNL missing-mass experiment refuted the notoriously famous CERN findings of A2-splitting. Unexpectedly high spin flip amplitudes were found in the reaction $\pi - p \rightarrow \pi + \pi - n$ in the CERN polarized target experiment that he led.

His occupation with semiconductor detectors and microelectronics was initiated by his involvement in charmed-particle and heavy-flavor physics in the NA11/NA32 , ALEPH and ATLAS experiments. A variety of silicon detectors grew out of this involvement, used initially for tracking in particle physics and later on for spectroscopy and imaging in X-ray astronomy and now also in industrial applications. They are partly based on the invention of new semiconductor structures for which he has been awarded several patents. To mention only a couple of them, the Silicon Drift Diode (SDD) and the Depleted Field Effect Transistor (DePFET), both based on the sideward depletion principle of Emilio Gatti and Pavel Rehak, are used in a variety of modifications for X-ray spectroscopy and imaging, with a version of the DePFET in which the signal charge can be measured repeatedly a measurement precision of 0.18 electrons could be achieved. Presently our recipient is occupied in the development of DePFETs with nonlinear characteristics and with gating capabilities to be used in X-ray spectroscopy and in astronomic missions.

Our recipient was also an active teacher. He lectured at Northeastern University and LMU Munich where he supervised several Ph.D. and master theses. He is the author of a seminal book *Semiconductor Radiation Detectors*.

Citation: For contributions to charmed particle physics, including silicon tracking detectors and the invention of innovative semiconductor structures such as SDDs and active pixel sensors (DePFETs) for X-ray spectroscopy and imaging.

Grehard Lutz can be reached via E-mail: gerhard.lutz@pnsensor.de

I hear you!

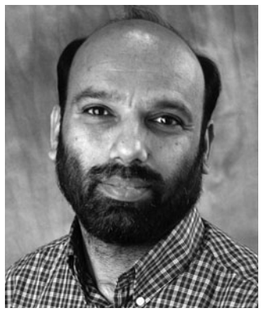
Are we talking, or are we only speaking?

David Manet

Awards

FELLOWS CLASS OF 2012

The IEEE offers Institute Awards, and most Societies and Society Technical Committees also offer awards. Elevation to IEEE Fellow is a prestigious honor awarded each year to no more than 0.1% of the full IEEE membership by the Institute's Board of Directors. Nominations are made from among Senior Members and nominees must be supported by at least six Fellows. After being reviewed and ranked by the appropriate IEEE Society, the nominations are forwarded to the Institute's Fellow Committee who then recommend a list of candidates to the IEEE Board of Directors for their consideration. The Nuclear and Plasma Sciences Society is justifiably proud of its Fellows. We present here the Class of 2012 Fellows, and wish them each our heartfelt congratulations.



Farhat Beg

FARHAT BEG

Farhat Beg received his Ph.D. in Plasma Physics from Imperial College London in 1995 and remained there first as a Research Associate and then as a Research Fellow In 2003 he joined the faculty at the University of California San Diego in the Department of Mechanical and Aerospace Engineering, where he currently is Professor of Engineering Physics.

Dr. Beg received the prestigious Institute of Electrical and Electronics Engineers (IEEE) Early Achievement Award in 2008 and was elected the Fellow of the American Physical Society in 2009. He has published over 130 articles in high quality journals—including *Nature, Nature Physics* and *Physical Review Letters*—and has been cited more than 3800 times in academic journals. Presently, he is leading the most active research group addressing critical issues related to short-pulse high-intensity laser matter interactions, fast ignition inertial confinement fusion (ICF), wire array z-pinches and neutron and X-ray sources. Below are selected examples of his scientific contributions.

Professor Beg has made important contributions to the field of high-intensity short-pulse laser matter interactions and generation of energetic particles. In his work on short-pulse laser-matter interaction [*Physics of Plasmas* **4**, **447** (1997)], he presented a scaling law between laser intensity and the hot electron temperature. This scaling law is widely used by researchers, and it is crucial to the understanding of the relativistic electron transport in high intensity (1020 Wcm^{-2}) laser matter interactions.

His innovative idea of generating a Z-pinch with a high-intensity short-pulse laser [*Physical Review Letters* **92** (2004)] showed that a superfast Z-pinch can be created by a return current produced in response to escaping fast electrons in short-pulse laser-matter interaction. Using the Trident sub-picosecond laser at Los Alamos Laboratory, he and his colleagues recently showed that the protons produced in short-pulse laser-matter interactions have unexpected curved trajectories due to the large electric fields in the beam [T. Bartal et al., *Nature Physics* (2011)]. A sheath electric field also channels the proton beam through the cone tip, substantially improving the beam focus.

His work on single-wire Z-pinches revealed that the fiber Z-pinches are unstable early in the current discharge, a significant contribution to the understanding of single wire dynamics [*Plasma Physics and Controlled Fusion* **39** (1997)]. Later articles address important

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They need a reason

Men never do evil so completely and cheerfully as when they do it from religious conviction.

Blaise Pascal

Environmentalist's lament?

We live in a nuclear powered universe. We're the oddballs by getting energy by burning carbon.

James Lovelock

(continued from page 33)

issues related to single-wire Z- and wire-array Z-pinches. He has also made significant contributions to produce compact pulsed-power-driven X-pinches for radiographic applications.

He extended this work to show that these compact systems can be used to characterize inertial confinement fusion capsules. Currently he and his group are working with General Atomics to develop reproducible point X-ray sources using laser cut X-pinches.

His work on the plasma focus based neutron source to characterize dark matter detectors generated considerable interest in the community [*Applied Physics Letters* **80** (2002)]. He showed conclusively that the use of plasma-focus-based neutron source addresses these issues (*Nature*, May 2002).

Professor Beg has served the plasma academic community in various capacities. He has served as a session and technical area organizer for several IEEE International Conferences on Plasma Science (ICOPS) conferences. He was the General Chair of a very successful IEEE International Conference on Plasma Science held in San Diego in 2009. He serves as the Chair, ICOPS budget subcommittee of the ExCom of the NPSS Plasma Science and Applications Technical Committee, of which he is an elected member. He has served as guest editor for the *IEEE Transactions on Plasma Science* special issue in April 2009, and is currently a guest editor.

He has been a panelist for the Department of Energy Fusion Energy Science Advisory Committee on High Energy Density Laboratory Plasmas. He served on the Research Needs Workshop for High Energy Density Laboratory Physics panel, as an expert on relativistic intense beams. In 2009-10 he served as a Chair of the High Energy Density Science Association (HEDSA, an association of scientists from academia that promote high energy density Laboratory Plasma in universities and small businesses, as well as in national laboratories).

Citation: For contributions to high intensity laser matter interactions and pulsed power Pinches.

Farhat Beg can be reached at Department of Mechanical and Aerospace Engineering Department and Center for Energy, University of California San Diego, 9500 Gilman Drive, La Jolla, CA 92093: E-mail: fbeg@ucsd.edu.

ALBERTO DEL GUERRA

Alberto Del Guerra was educated at the University of Pisa (Italy), where he received the doctoral degree in Physics in 1968. He started his research career in particle physics at Daresbury Laboratory (UK) participating in a series of electro-production experiments. His research concentrated on the experimental techniques. In the late 1970s he began work to develop detectors for biomedical applications and spent two years (1981–82) as a Fulbright Scholar at Lawrence Berkeley Laboratory (USA), working on gas chamber PET detectors using a solution similar to that originally proposed by George Charpak. Since then he has become very much involved in PET technology and Medical Imaging both for Digital Radiology and Nuclear Medicine.

He was appointed Full Professor in Physics in 1987 at University of Naples (Italy); from there he moved to the University of Ferrara (Italy) as Full Professor in Medical Physics in 1991. In 1998 he returned to his home University of Pisa where he is Full Professor in Medical Physics, Head and Director of the Specialty School in Medical Physics and Research Group leader of the Functional Imaging and Instrumentation Group at the Department of Physics.

A major field of his research has been molecular imaging. He has built one of the first successful small animal PET systems for rat and mouse imaging, called YAPPET based on a high light output - medium density scintillator such as YAP, to take advantage of the higher resolution one can obtain from single scattering in the crystal. The performance of this device was among the best at that time (late 1990s) and it is still competitive in preclinical PET applications.

The YAPPET system evolved into a commercial product and is currently employed by several groups worldwide. More recently a high-resolution small-animal CT scanner has been constructed under his scientific direction. Among other applications the micro-CT is currently used for stem cells—bone repair studies in rats.

In the early 1990s he was one of first researchers to suggest the application of PET for monitoring the "in vivo" dose in proton therapy. This research program led to the development of a dedicated PET prototype that has been tested successfully on phantoms at an eye proton therapy facility (62 MeV protons, in Catania, Italy), demonstrating that a resolution below one mm is obtainable on the distal dose fall-off.

In the last ten years he has pioneered research on new solid-state detectors, the so-called Silicon Photomultipliers (SiPM), for use in nuclear medicine imaging and especially in PET. He has strongly contributed to the development and characterization of these devices from a single detector to a matrix on monolithic substrate, in strict collaboration with solid-state research laboratories. He has directed several multi-university/research institution collaborations For almost 10 years he has directed several on this research topic. The results obtained are very promising for the actual use of this technology in PET, both for its spatial and time resolution and its MR compatibility.

He is author or coauthor of over 200 journal articles and of more than 200 papers in proceedings of international conferences. He has been on review panels for several institutions in Italy, in Europe and overseas, and reviewer for many scientific journals. He has been chair of the Scientific Committee, Vice-President, President, Past President and he is now Honorary Member of EFOMP (European Federation of Organizations for Medical Physics). He has been the Physics representative

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Alberto Del Guerra

Hitting home

This is a paradoxical time. We have more information but less time to think through its complexity. We're connecting globally but talking parochially.

Shelly Turkle

(continued from page 35)

with ECR and with EANM for many years. He has been Editor-in-Chief of the journal *Physica Medica-European Journal of Medical Physics* (1988–2008) and Honorary Editor since 2009.

He joined IEEE in 1987 as an NPSS Member. He was Guest Editor for the 1996 IEEE NSS/MIC in Anaheim; NSS chair for the 1999 IEEE NSS/ MIC in Seattle, General Chair of the 2004 IEEE NSS/MIC in Rome (Italy) and MIC Chair for the 2011 IEEE NSS/MIC in Valencia (Spain). He has been member of the RISC, NMISC, CIP, TNC and Oversight Committees.

Citation: For contribution to radiation detectors and systems for medical physics and molecular imaging.

Alberto Del Guerra can be reached via E-mail: Alberto.delguerra@df.unipi.it.

Nadim F. Haddad

NADIM F. HADDAD

Nadim F. Haddad is a Technical Director and Engineering Fellow at BAE Systems in Manassas, VA. Nadim received his B.A. in Physics and Mathematics in 1965 from Kansas Wesleyan University and his M.S. in Electrical Engineering in 1966 from Michigan State University. He joined IBM Components Division in East Fishkill, NY and became a manager of Yield Diagnostics, then transferred to the Federal Systems Division in Manassas, VA, as a manager of Semiconductor Technology Development. He then rejoined the technical team as a Senior Technical Staff Member, and served as a principal investigator for the VLSI Independent Research and Development. Nadim was the lead engineer for the development of radiation-hardened technology for the Very High Speed Integrated Circuit (VHSIC) Program, Radiation Hardened Microelectronics Program, among others; and was instrumental to the development of nine generations of radiation-hardened technology and products at IBM, Loral, Lockheed Martin and BAE Systems. His approach capitalized on significant commercial investment in driving forward the development of radiation-hardened technologies and products for space in support of military, civil and commercial applications.

Nadim is an active participant in several technology forums including the IEEE Nuclear and Space Radiation Effects Conference (NSREC), Hardened Electronics and Radiation Technology (HEART), Government Microcircuit Applications and Critical Technology Conference (GOMACTech), IEEE International SOI Conference, Radiation and its Effects on Components and Systems (RADECS), and Single Event Effects Symposium (SEE) as an author/presenter, paper reviewer, short course instructor, session chair and technical program chair. He authored or coauthored over 100 publications and is credited with 26 inventions.

Citation: For development of radiation hardened semiconductor device technology and products for space applications.

Nadim Haddad can be reached at BAE Systems, 9300 Wellington Road, Manassas, VA 20110. Phone: 703-367-5251; E-mail: nadim.haddad@baesystems.com.

MICHAEL KONG

Dr. Michael Kong holds a Chair in Bioelectrical Engineering at Loughborough University, UK and is Co-Director of the Centre for Biological Engineering at Loughborough. He was trained as an electrical engineer and applied physicist with B.Sc. (1984) and M.Sc. (1986), both in Physical Electronics from Zhejiang University, China, and a Ph.D. (1992) in Electrical Engineering from the University of Liverpool, UK. His academic career started in 1995 with a lectureship at the University of Liverpool; He moved to Loughborough University in 1999 as a Senior Lecturer before being promoted to full professor at Loughborough in 2004.

Dr. Kong has crossed discipline boundaries several times in his career, from electron-beam laser physics and computational electromagnetism, through microwave engineering, optics and optical sensors, arc plasmas, and low-temperature atmospheric plasmas and their biomedical effects. Dr. Kong made seminal contributions to the basic science of cold atmospheric plasmas (CAPs) in the early 2000s when CAP physics was poorly understood and the inherent instabilities of CAPs were often addressed empirically. Through a systematic program of experimental and computational studies, his team discovered the existence of two modes in radio-frequency (RF) capacitively coupled CAPs, a low-current alpha mode and a high-current gamma mode. His work on modes and mode transitions has shown that RF CAPs often become unstable via sheath breakdown and a key pathway to sheath breakdown is via the gamma mode. This finding has led to several innovations in CAP sources science and technology proposed by his group, for example radio-frequency dielectric-barrier discharges, sheath-only RF CAPs, and pulse-modulated radio-frequency CAPs. In addition, he and his team have used nanosecond pulses not only to suppress plasma instabilities but also to modulate reaction chemistry of low-temperature atmospheric plasmas. These fundamental plasma-physics studies have been critical in enabling effective use of atmospheric plasmas in treating living cells and tissues.

Dr. Kong is universally known as a leading pioneer and a world leader in plasma medicine, a rapidly growing area at the interface between plasma science and biomedicine. His team was the first to demonstrate that low-temperature atmospheric plasmas can effectively denature biomolecules, particularly proteins and animal tissues. This has several important implications, firstly the possibility of disinfecting prions, the most resistant known contaminants that evade all commercial decontamination strategies, and secondly the possibility of controlling cancer metastasis by means of inactivating adhesion proteins.

In the field of low-temperature atmospheric plasmas and their biological effects, Dr. Kong has given over 60 plenary/invited talks at international conferences, written three book/book chapters, and published some 320 peer-reviewed technical papers including over 130 journal papers. He is a member of the editorial board of Plasma Sources Science and Technology, a guest editor for *IEEE Transactions on Plasma Science*, *Plasma Processes and Polymers*, and the *New Journal of Physics*. He is the General Chair for the 39th IEEE International Conference on Plasma Science (ICOPS) to be held in Edinburgh in July 2012. Dr. Kong shared the inaugural Plasma Medicine Award from the International Society for Plasma Medicine.

Citation: For contributions to atmospheric pressure glow discharge sources in biology and medicine.

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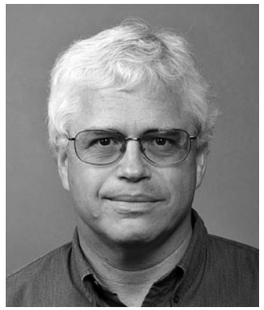
(continued on page 38)

Micheal Kong

Past glory

It is easy to be a child prodigy, but much harder to be an adult prodigy

Valentine L. Telegdi



John Maenchen

(continued from page 37)

JOHN MAENCHEN

Dr. John Maenchen is Science Advisor to the Department of Energy National Nuclear Security Administration Principal Deputy Administrator for Defense Programs.

Dr. Maenchen received a Ph.D. in ElectroPhysics from Cornell University in 1983 and immediately joined Sandia National Laboratories. As both a scientist and manager he has advanced science, technology, and engineering through the design and construction of pulsed-power accelerators, the invention and development of new intense electron-beam, ion-beam, and z-pinch loads, the modeling and theory of their operation, the invention of diagnostic approaches to investigate their performance, and the invention and development of new government and commercial applications for these capabilities. During this time he initiated a resurgence in pulsed-power-driven flash radiographic technologies, leading an international team to significantly advance the state of the art. This body of achievement was honored by the 2009 IEEE Nuclear and Plasma Science Society Pulsed Power Science and Technology Committee's Peter Haas award.

Subsequent to these activities, Dr. Maenchen managed the Nuclear Weapons Science and Technology Program international strategic planning, the site Deinventory of Special Nuclear Materials, and the Readiness in Technical Base and Facilities portfolio. Since 2009 he has served as Science Advisor to the National Nuclear Security Administration Principal Deputy Administrator for Defense Programs.

To date, Dr. Maenchen has authored or coauthored over 130 publications, 36 in refereed journals and the rest in reviewed conference publications and archived reports. His patents reflect unique and original insight into the application of pulsed-power-driven, high-intensity particle beams for radiopharmaceutical production utilizing a novel process which minimizes radioactive waste streams. He is the recipient of the 2009 IEEE Peter Haas award, recognizing ***outstanding contributions to pulsed power technology resulting from a continued effort to develop programs of research, education, and information exchange***. He has initiated and augmented research programs and technical exchanges between universities both across the U.S. and internationally and the DOE National Laboratories which are today providing highly trained Masters and Doctorate graduates to the pulsed power and particle beam research fields. Dr. Maenchen has been an internationally recognized leader in this field for more than twenty years. He has been actively involved with the IEEE since 1976.

Citation: For leadership in the development of intense pulsed charged particle beams and their application for flash radiography.

John Maenchen can be reached via E-mail: jemaenc@sandia.gov

Pro-deficient

A specialist is someone who does everything else worse.

Ruggiero Ricci

PETER J. MCNULTY

Peter J. McNulty is currently Professor of Physics and Astronomy at Clemson University where he was Head/Chair of the department from 1988 to 2001. He was formerly a member of the physics faculty at Clarkson University.

McNulty received his B.S. degree in physics from Fordham University, New York City, NY, in 1962 and the Ph.D. degree in physics from the State University of NY, Buffalo, in 1965 where he studied high-energy nuclear reactions. From September 1965 to August 1966, he was a University of Buffalo Postdoctoral Fellow. In 1966, he joined the faculty of Clarkson College of Technology (now Clarkson University) serving as an Assistant Professor of Physics (1966 to 1972), Associate Professor (1972 to 1979) and Full Professor (1979 to 1988). From 1970 to 1971 and again from 1979 to 1980, he was a Senior National Research Council Associate at the Space Physics Laboratory of the Air Force Geophysics Laboratory, Hanscom AFB, MA, analyzing the light flashes observed by astronauts and the proton-induced soft errors observed in microelectronic memories. From September 1972 to August 1973, he was Visiting Associate Scientist in the Biology Department of Brookhaven National Laboratory, Upton, NY, where he organized and led several experimental collaborations to simulate the light flashes first observed by Apollo astronauts and experiments on mutations induced through nuclear reactions in Tradescantia stamen hair cells and in maize.

He and his colleagues wrote the first quantitative models for light flashes observed by Apollo astronauts. Light flashes are induced in the retina by the passage of heavy cosmic rays through the retina or protons undergoing nuclear spallation reactions within the photoreceptor layer of the retina. These were the first examples of what later became known as single-event transients. He and a student adapted the proton light-flash model to silicon, while improving the nuclear models, to predict single-event upsets in microelectronics. This code (CUPID) was subsequently shown, when combined with the NASA AP8 model, to accurately predict the energy-deposition events observed in Clemson's LET spectrometer on the CRRES satellite. He organized and led the experiment at the Harvard Cyclotron in which proton-induced single event upsets in microelectronic memories were first demonstrated.

Radiation effects on microelectronics are due to total ionizing dose, large energy-deposition events generated by the traversals of heavy ions and nuclear reactions induced by protons and displacement damage generated by nonionizing energy loss. He led in the development of dosimeters that monitored the radiation environment through a variety of mechanisms and provided quick feedback from satellites to the ground. They have flown on the CRRES and MPTB satellites, and are scheduled to fly on NASA's SET-1 satellite mission. He and students developed the application of arrays of FGMOS transistors as organized within UVPROM memories as dosimeters which require no power during exposure and have a nondestructive readout.

Professor McNulty is the author or coauthor of over 135 papers in refereed journals or chapters in books and he holds two patents. He has been active in the radiation-effects community attending and presenting papers at almost every Nuclear and Space Radiation Effects Conference (NSREC) since 1971 and most of the Radiation and its Effects on Components and Systems (RADECS) conferences since they began, winning a best-poster paper award in 2005. He was short-course chair (1990), short-course speaker (1990), technical program chair (1995), poster chair (1989) and awards chair (1988) for NSREC and international liaison (2005) and advisory committee member (2010) for RADECS. Most important, he was an advisor to 14 Ph.D. students and 23 M.S. students, many of whom hold prominent positions in the field of radiation effects.

Citation: For contributions to radiation-induced soft errors in microelectronics.

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Peter J. McNulty

Hagiography

The closest to perfection a person ever comes is when he fills out a job application form.

Evan Esar


Andreas A. Neuber

(continued from page 39)

ANDREAS A. NEUBER

Andreas Neuber is the AT&T Professor of Electrical and Computer Engineering at Texas Tech University, Lubbock, TX and Associate Director of the Center for Pulsed Power and Power Electronics. He holds an engineering doctorate and is a licensed professional engineer.

After completing mandatory military service in the German Army in the 1980s, Dr. Neuber enrolled as physics major at the Technische Hochschule Darmstadt. His first exposure to high voltage and dielectric breakdown came as a graduate student in the Institute for Applied Physics, where he designed and built an X-ray preionized KrF* Excimer laser, as well as coauthored his first peer-reviewed journal paper. Following his diploma in physics in 1990, he began working for the mechanical engineering department at the Institute for "Energie und Kraftwerkstechnik", in Darmstadt. Pulsed laser work continued and skills were honed in time-resolved diagnostics on turbulent combustion systems using Coherent Anti-Stokes Raman Spectroscopy.

In 1996, Dr. Neuber received the Dr.-Ing. (Engineering Doctorate) in Mechanical Engineering and joined the Pulsed Power Laboratory at Texas Tech University in Lubbock, TX. Dr. Neuber soon became tenure-track faculty of the electrical engineering department while continuing his research in the Center for Pulsed Power and Power Electronics with Dr. M. Kristiansen as center director. Since his arrival in the U.S., Dr. Neuber has attended virtually all IEEE Pulsed Power and Power Modulator conferences. He has been involved as session organizer and session chair as well as technical program chair in 2002 and 2003. He has served twice as guest editor for *IEEE Transactions Special Issues on Power Modulators and Repetitive Pulsed Power.*

Dr. Neuber has traveled extensively to present at conferences or give short courses on pulsed power and dielectric breakdown. At present Dr. Neuber advises 12 graduate students, all in fields related to dielectric flashover and pulsed power. His students conduct research on high power microwave breakdown at atmospheric pressure along dielectric surfaces, basic research on vacuum ultraviolet emission from atmospheric pulsed surface discharges contributing to streamer formation, compact pulsed-power generator design, and explosive-driven pulsed power. Based on collaboration with colleagues from the University of Loughborough, UK, Texas A&M, and the then-University Missouri-Rolla, in 2005 Dr. Neuber edited and coauthored a book titled Explosively Driven Pulsed Power focusing on Helical Magnetic Flux Compression Generators. Dr. Neuber has authored and coauthored 72 refereed journal articles and about 160 conference papers. He is also the received the 2010 William G. Dunbar Award sponsored by the IEEE Dielectrics and Electrical Insulation Society.

Dr. Neuber's work in electric breakdown has advanced the fundamental understanding of the physics of dielectric surface flashover. In addition to the 45 peer -refereed publications on electrical breakdown alone, he has given many plenary and invited presentations on the topic. Together with the sixteen students that he has seen graduate in the field of dielectric breakdown and surface flashover alone, he has built himself an international reputation.

Citation: For contributions to the physics of dielectric surface flashover in high electric fields.

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E-mail: Andreas.Neuber@ttu.edu

GRAHAM C. SMITH

Graham Smith received his B.Sc. in 1970, and his Ph.D. in 1974, both in Physics, at Durham University, England. He then spent eight years as a postdoctoral research associate in the physics department at Leicester University, England, developing multiwire chambers and microchannel plates for imaging experiments in X-ray astronomy. Notable achievements were the first two-dimensional image ever recorded in the X-ray waveband of a supernova remnant (the Cygnus Loop) and development of a new position sensitive cathode, the graded density electrode.

In 1982 he joined Brookhaven National Laboratory's Instrumentation Division to participate in development of high-accuracy position-sensitive detectors and electronics. His initial research continued with developing X-ray detection instrumentation, this time for synchrotron experiments. He undertook an extensive program that studied some of the fundamental limitations to position resolution in gas-filled detectors for X-rays, resulting in a much improved understanding of the role played by the range of the photo-electron. A suite of position sensitive detectors was developed with unparalleled position resolution and low differential nonlinearity.

He now leads the Gas and Liquids Detector group in Instrumentation Division, developing detectors for ionizing radiation measurements in synchrotron, neutron and particle physics. He has helped to create new position encoding techniques for many types of gas detector, where the conversion position of the incoming radiation is determined by interpolating the center of gravity from a series of amplitude measurements on the cathode.

Several of these interpolating cathodes developed by his group have been used in large area gas detectors of the ATLAS experiment at the Large Hadron Collider at CERN, and in subsystems of the PHENIX experiment at Brookhaven's RHIC facility. His group also carries out research and development of new electron multiplying structures based on lithographic techniques, such as the gas electron multiplier.

His research group has developed and fabricated thermal neutron detector systems, based upon helium-3 filled chambers, for user facilities such as LANSCE (Los Alamos), SNS (Oak Ridge), NIST Center for Neutron Research (Gaithersburg, MD) and the OPAL reactor at ANSTO, Australia. This work involves fundamental studies of the neutron conversion process, and has resulted in neutron systems with unmatched precision and stability. His most recent research involves developing advanced neutron detection techniques for future instruments, based upon direct collection of the primary ionization created after neutron conversion in helium-3, with no electron multiplication. Relying heavily on application specific integrated circuits, this principle increases counting rate and improves long term stability significantly.

He received Brookhaven's Research and Development Award in 1996, and the IEEE Long Island Regional Award for Contributions to High Energy Physics in 1998.

Citation: For contributions to the advancement of detectors for x-rays, charged particles and thermal neutrons

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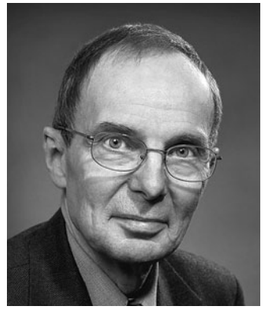
Graham C. Smith

So there!

A graceful taunt is worth a thousand insults.

Louis Nizer


Mark Tillack

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MARK TILLACK

Mark Tillack received a B.S. degree (1978) in Nuclear Engineering from the University of Wisconsin in Madison, where he already began research on fusion energy technology. He helped to develop charged particle detectors that were used at the RTNS-I facility at Lawrence Livermore National Laboratory, spending one summer as an intern helping to measure nuclear cross sections for fusion. He received his M.S. (1980) and Ph.D. (1983) degrees in Nuclear Engineering from MIT, where he studied lithium fires and structural effects of disruptions in tokamaks. During his graduate student days, he interned at the Oak Ridge National Laboratory (writing software for the Thomson scattering diagnostic on ISX-B), Idaho National Laboratory (studying fusion safety), and Argonne National Laboratory (developing eddy current models).

Upon graduation from MIT, he drove his beat-up old VW Rabbit across the country for a job at the University of California, where he continues to work to this day. At UCLA, he led a group of staff and students studying liquid metal blankets and developed models for liquid metal magnetohydrodynamics. He helped to establish a laboratory for studies of both liquid and solid breeder blankets, and contributed to the conceptual design phase of ITER, especially in helping to define the nuclear test program.

In 1994 Dr. Tillack moved to the San Diego campus of the University of California, to become the engineering group leader for the U.S. fusion power plant studies program. He led engineering design activities on the ARIES-RS reversed shear tokamak and the ARIES-ST spherical tokamak. In 1998 he initiated research on inertial fusion energy at UCSD with an emphasis on "chamber physics," which involves the post-blast responses in IFE reaction chambers. He played a key role in the high average power laser program (HAPL), developing damage-resistant final optics, demonstrating target tracking and engagement systems, and contributing to other chamber research activities.

In 2004, Dr. Tillack began research on extreme ultraviolet semiconductor lithography as a spin-off from his research on IFE chamber physics. He created a laser-plasma laboratory at UC San Diego, and has worked together with several private industry groups, including KLA-Tencor, Cymer, EUVA/Gigaphoton and General Atomics. The research aims to enable next-generation chip manufacturing and metrology using 13.5-nm (or shorter) light sources generated in laser-produced plasmas. Studies involve plasma evolution and the generation and transport of both light and particles in laser-produced plasmas.

During the course of his career, Dr. Tillack served as a visiting researcher or visiting professor at the Kernforschungszentrum Karlsruhe (now called Karlsruhe Institute of Technology), Universidad Politécnica de Madrid, and Kyoto University.

He has been actively involved with IEEE activities since 1997, when he became a member of the Fusion Technology Committee of the NPSS and served as program chair for the 17th IEEE NPSS Symposium on Fusion Energy. From 2006–2009 he served as chair of the Fusion Technical Committee and member of the NPSS Administrative Committee. In 2009 he chaired the 23rd Symposium on Fusion Energy. He also currently serves as an elected member of the Executive Committee of the American Nuclear Society Fusion Energy Division.

At this time, Dr. Tillack is a Research Scientist and Lecturer in the Mechanical and Aerospace Engineering Department, and serves as the Associate Director of the UCSD Center for Energy Research.

Citation: For contributions to fusion energy technology.

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And it's non-invasive

No drug, not even alcohol, causes the fundamental ills of society. If we're looking for the sources of our troubles, we shouldn't test people for drugs, we should test them for stupidity, ignorance, greed, and love of power.

P. J. O'Rourke

THOMAS WEILAND

Born in 1951, Thomas Weiland studied electrical engineering and mathematics until 1975 at the Technische Hochschule Darmstadt, and gained his Dr.-Ing. (Ph.D.) in 1977. (This university installed the very first chair of electrical engineering worldwide in 1882.)

As fellow at the European Institute for Nuclear Research (CERN, Switzerland) he began his first studies on electromagnetic simulation of relativistic charged particles in the time domain. His results were crucial contributions to the design and construction of the Large Electron-Positron collider (LEP) at CERN. In 1983, at the Deutsches Elektronen Synchrotron (DESY) in Hamburg, he set up an international collaboration in order to develop the software package MAFIA for 3D electromagnetic and charged particle simulation. This software package was distributed worldwide and became the standard electromagnetics tool in all accelerator laboratories. In 1986 he received the Physics Prize from the German Physical Society for his contributions to the field of scientific computing, and the U.S. Particle Accelerator School's Prize for Achievements in Accelerator Physics and Technology. Apart from his contributions to the field of numerical field calculations he also worked experimentally on new techniques for particle acceleration. In 1982, together with G.A. Voss, he invented the wake field acceleration mechanism and demonstrated it in a worldwide recognized experiment. In 1987 he received the Leibniz Prize from the German Research Association, which is the highest scientific award in Germany. Since 1989 he has been a full professor at the Darmstadt University of Technology, as well as head of the Computational Electromagnetics Laboratory. In 1992 he founded the Computer Simulation Technology AG (CST), which is recognized as the market leader in 3D EM Time Domain technology. He now serves as CST's chairman of the supervisory board. In 1992 he was elected a member of the Academy of Science and Literature, Mainz. In 1995 he won the Max Planck-Research Prize for International Collaboration and in 1997 was awarded the Philip Morris Research Prize. In 2004 he was awarded an honorary professorship by the Tongji University in Shanghai. He published over 800 scientific and technical papers on numerical methods for field computation and accelerator technology and gave hundreds of presentations at international conferences. He successfully supervised over 80 Ph.D. students and 50 postdocs.

Citation: For development of the finite integration technique and impact of the associated software on electromagnetic engineering

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Thomas Weiland

Eyes front!

To look back is to relax one's vigil.

Bette Davis

Craig Woody

(continued from page 43)

CRAIG WOODY

Craig Woody received his B.A., M.A. and Ph.D. from John Hopkins University in 1973, 1974 and 1978, respectively, having carried out his thesis research in high energy particle physics at the Stanford Linear Accelerator Center. After one year as a postdoctoral Research Associate at Stanford University, he joined Brookhaven National Laboratory in 1979, where he has remained ever since. During his first three years at Brookhaven, he worked at CERN building detectors and performing experiments at the Intersecting Storage Ring collider. Upon returning to Brookhaven, he worked on particle physics and heavy ion experiments at the Alternating Gradient Synchrotron, was spokesman for AGS Experiment E855, and is currently working on the PHENIX experiment at Brookhaven's Relativistic Heavy Ion Collider.

Dr. Woody's main area of interest has been in the development of particle detectors for high energy and nuclear physics and medical imaging. He helped build the first uranium scintillator calorimeters used at CERN in the early 1980s, and in the mid 1990s and helped design and build the lead scintillator calorimeter used at PHENIX. In the mid 1980s and early 1990s, he studied scintillating crystals for use in calorimetry for particle physics. In particular, he investigated their radiation damage properties for use at high luminosity colliding beam accelerators, such as the Superconducting Super Collider that was proposed at the time but later cancelled, and the Large Hadron collider that is now operating at CERN. He later used scintillating crystals to build a small animal Positron Emission Tomography scanner known as the RatCAP that can be used to image the brain of an unanesthetized rat. He developed the RatCAP in collaboration with his colleagues at Brookhaven and Stony Brook University, and this device has now led to other PET scanners that can be used for simultaneous PET-MRI imaging of animals and humans. He also developed a novel, high-performance Cherenkov counter known as the Hadron Blind Detector in collaboration with his colleagues from Stony Brook and the Weizmann Institute in Israel. This was used to measure low mass electron pairs in relativistic heavy-ion collisions in the PHENIX experiment at RHIC.

Dr. Woody is currently a Senior Physicist in the Physics Department at Brookhaven and was Group Leader of the BNL PHENIX Group from 2001-2008. He is a Fellow of the American Physical Society nominated by the Division of Particles and Fields and was awarded a DOE Outstanding Mentor Award in 2008. He is also included on three U.S. patents related to the RatCAP. He was President of NPSS from 2009-2010, and served as an elected member to AdCom from Radiation Instrumentation from 2006-2009. He also served on RISC from 2001 to 2003, and was Chair of RISC from 2004 through 2005. He was Chair of the RISC/NMISC Joint Oversight Committee from 2006-2008, and is still currently serving on the Oversight Committee. He was General Chair of the NSS/MIC conference in Toronto in 1998 and served as Deputy NSS Chair in Albuquerque in 1997.

Citation: For the development of radiation detectors for high energy and nuclear physics, and medical imaging.

Craig Woody can be reached at the Brookhaven National Laboratory, Physics Department Bldg 510C, Upton,NY 11973, USA; Phone: +1 631 344 2752; Fax: +1 631 344 3253; E-mail: woody@bnl.gov.

Inaudible response

Good words make us laugh; good deeds make us silent.

French Proverb

2012 Plasma Science and Applications (PSAC) Award Winner Announced

Andrew Ng
PSAC Award recipient

The 2012 PSAC Award for outstanding contributions to the field of Plasma Science has been awarded to Professor Andrew Ng. The PSAC Award recognizes those who have made outstanding contributions to plasma science including novel applications of this diverse field. The award includes a plaque and $3000 cash prize. As part of the award, Andrew Ng will be invited to present a plenary lecture entitled "Warm Dense Matter—the missing link between condensed matter and plasma" at the 2012 International Conference on Plasma Science held in Edinburgh, Scotland. The invited talk will be published in the *IEEE Transactions on Plasma Science*. The PSAC Award recognizes Andrew Ng for his pioneering contributions and leadership in the field of Warm Dense Matter (WDM) Science and his exemplary service to PSAC.

Andrew Ng received his B.Sc. degree from the University of Hong Kong and his M.Sc. and Ph.D. degrees from The University of Western Ontario. Prior to joining the Department of Physics at the University of British Columbia in 1980, he was a National Research Council of Canada Postdoctoral Fellow in the Department of Electrical Engineering at the University of Alberta. In 2003, he joined the Lawrence Livermore National Laboratory as Scientific Director of the Jupiter Laser Facility. With the successful establishment of JLF, he returned to UBC in 2008 to continue research as an Emeritus Professor.

Prof. Ng is a recipient of the C.A. McDowell Medal and the Izaak Walton Killam Research Prize at UBC, the Lawrence Livermore National Laboratory Science and Technology Award, the Merit Award and the PSAC award of the IEEE Nuclear and Plasma Sciences Society. He is a Fellow of the American Physical Society Fellow and an IEEE Fellow. Prof. Ng has been fascinated by the multidisciplinary nature of plasma science. He is particularly interested in the link between condensed matter physics and plasma physics. He strives to understand the transition from a condensed matter to a plasma state in the regime for which he has coined the description "Warm Dense Matter." This regime is also key to research in high-pressure science, planetary science and inertial confinement fusion. In 2000, Prof. Ng initiated the International Workshop on Warm Dense Matter to bring together scientists from a wide range of disciplines. The meeting has since been held in Canada (2000, 2005), Germany (2002), France (2007), Japan (2009) and the U.S.A. (2011).

Professor Ng's contributions to WDM science spans more than twenty years; his research utilizes two different platforms. The WDM regime first caught his attention around 1982 in his shock physics research. He realized that a single steady shock at Mbar pressure produces a well-defined, uniform state with above-solid density and temperature of the order of electron volts, a state that was clearly poorly described by theory. At the same time, he recognized the unique advantage of laser-driven shock in its ease of attaining pressure in excess of 10 Mbar as well as synchronization with high-speed diagnostics such as picosecond optical and X-ray streak cameras. The latter is of paramount importance as it enables probing of shock states with unprecedented temporal resolution. With these insights Prof. Ng developed a broad-scope research program based on

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But don't bet on it

The only sure thing about luck is that it will change.

Bret Harte

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laser-driven shock compression studies. His work led to seminal contributions to the understanding of equation of state, transport properties, and nonequilibrium shock states in the field that became WDM science. In 1992, Prof. Ng turned to intense femtosecond lasers as a means of producing highly nonequilibrium states with a temperature asymmetry of higher electron temperature as opposed to the higher ion temperature asymmetry found in nonequilibrium shock states. This resulted in his pioneering contributions not only in transport studies but also in developing laser-induced isochoric heating that has led to the discovery of nonequilibrium, superheated solid phase of Warm Dense Matter.

He made significant contributions in developing equation-of-state models. He provided the first corroboration of Hugoniot temperature predictions from the Sesame equation of state for aluminum up to 12 Mbar. This is highly significant as Sesame is the most widely used equation of state in simulation codes. Another far-reaching impact of this work is the demonstrated viability of laser-driven shock for equation-of-state studies. This ignited renewed interest in laser shock that now plays a central role in High Energy Density research. Prof. Ng's use of streak cameras to capture optical emission from a shock front for brightness and spectral temperature determination has become a technique known as Streak Optical Pyrometry (SOP) that is universally used in high-pressure laser shock experiments.

A topic of long-standing intrigue is minimum conductivity that occurs between the hot solid and warm plasma phases of matter. Substantial divergence exists among theoretical models, including Sesame and Lee and More's conductivity models that are commonly used in hydrodynamic simulations. Prof. Ng was the first to use laser reflectivity measurement as a probe of electrical conductivity of a laser-driven shock compressed state. His results became the first benchmark of the Lee and More model in the WDM regime. This gave confidence in furthering its use in numerous simulations. His approach of probing optical reflectivity of shock wave with ps resolution found broad applications in investigation of hot expanded states in shock release of solids and others in studies of electronic excitation and melting transition in shock states. It was also adapted by Prof. Ng as an in-situ diagnostic of shock-front emissivity in simultaneous measurements with shock emission to enable the first model-independent determination of shock temperature for the study of electron-ion equilibration in a shock wave.

Another equally important transport property of WDM is X-ray opacity. In 1989, Prof. Ng made the first measurement of K-edge shift in shock compressed aluminum revealing shifts much greater than that predicted by the HOPE or INFERNO codes at LLNL. The work triggered a new experiment on the Nova 2-Beam facility, in which Prof. Ng found both shock-induced red shifts in the aluminum K-edge and the unexpected appearance of the Al+4 Ka absorption line. This led him to devise a unique approach of opacity measurements. A steady shock in aluminum yields a uniform state of WDM whose density and temperature can be derived from measured shock speed using a well-known equation of state. As the thickness of the shock state increases linearly with shock propagation time, X-ray transmission at Ka line energy decreases. The slope of this linear dependence yields corresponding absorption cross-section kn. Such well defined measurements of kn(ne, Te) are benchmarks critically missing in the WDM regime. The significance of such an experiment goes even further.

Implicit learning

Education is a worthy thing, but it is wise to remember from time to time that nothing that is worth knowing can be taught.

Oscar Wilde

And pay attention

Logic takes care of itself; all we have to do is to look and see how it does it.

Ludwig Wittgenstein

It offers a new means of determining ion abundance (Al+4 in this case), a result much needed for advancing our understanding of ionization in Warm Dense Matter.

Electrical conductivity is clearly an ongoing concern in WDM science. While Prof. Ng's shock wave reflectivity experiment discussed above showed agreement with the Lee and More model, the validity of several models including the Lee and More model was called into question by reported resistivity maximum (conductivity minimum) interpreted from measured self-reflectivity of intense fs laser in aluminum. This created quite a lot of excitement. However when the reflectivity data were compared directly, without inferring resistivity and temperature, with simulations that took into account electromagnetic wave propagation and hydrodynamics, the experimental observations were found by him to be consistent with the Lee and More conductivities. The impact of this clarification is substantial as Lee and More's model continues to play a vital role in many hydrodynamic simulations.

The technique of laser-induced isochoric heating was first introduced by Prof. Ng in his ground breaking "Idealized Slab Plasma" concept for determining ac conductivity of a WDM state. This elegant idea uses ultrafast laser deposition and electron transport to rapidly and uniformly heat a foil of tens of nm thickness before on set of significant expansion. The resulting state is thus created under isochoric condition, maintaining its initial solid density. The state is further defined by measured excitation energy density. Its nanometer scale allows observation of reflectivity and transmission of fs laser probe. With the heated sample behaving like a uniform dielectric slab, these measurements can be used to solve for the complex ac conductivity–yielding complex conductivity as a function of solid density and excitation energy density.

Prof. Ng has contributed extensively in service to the IEEE Plasma Science and Applications Committee (PSAC). He was Chairman of the 1993 IEEE ICOPS. He has served three terms on the PSAC ExCom and as Site Selection Chair, he facilitated the location of the first ICOPS outside North America in Korea in 2003.

After retiring from LLNL to resume his position as Emeritus Professor, he initiated a Canadian Consortium for Warm Dense Matter Research, organizing his Canadian colleagues, postdocs, and students to engage in collaborative studies with international peers by conducting experiments in state-of-the-art facilities worldwide.

Prof. Ng's work on laser-driven shock and ultrafast laser matter interaction has been recognized in his IEEE NPSS Merit Award in 1997 and election to APS Fellow in 1998. His contribution to plasma science concerning Warm Dense Matter is cited in his election to IEEE Fellow in 2002. It is without a doubt that his pioneering contributions and leadership have been instrumental to the establishment and advancement of the field of Warm Dense Matter science.

Citation: For pioneering contributions to Warm Dense Matter Science through research on laser-driven shock compression and isochoric laser heating of solids, and for pivotal leadership in the advancement of Warm Dense Matter as a multidisciplinary scientific frontier.

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OOPS!

It is worse than a crime: it is a mistake.

Joseph Fouche

Hutch Neilson

Charting the Roadmap to Magnetic Fusion Energy

With the ITER project now launched on its mission to answer outstanding questions regarding the control of a burning plasma, the countries engaged in fusion research are planning, with renewed intensity, the research and major facilities needed to develop the fusion nuclear science and technology for harnessing magnetic fusion energy (MFE). This trend was clearly evident at the June 2011 Symposium on Fusion Engineering (SOFE), which included a joint plenary talk by Professor Jiangang Li, Director of the Chinese Academy of Sciences' Institute for Plasma Physics, entitled "The Future of Fusion;" a session on the Pathway to Fusion; and an evening Town Meeting on "Accelerating the Development of Fusion Power."

In September, fusion researchers met at Princeton University to discuss the major steps on the roadmap to commercial fusion energy. The international workshop, "MFE Roadmapping in the ITER Era," was hosted by the Princeton Plasma Physics Laboratory (PPPL), organized by an international committee of fusion leaders, and attended by 65 participants. Workshop materials, including lists of the organizers and participants and all presentations and summaries, are available at http://advprojects.pppl.gov/Roadmapping.

At the September workshop, fusion community representatives from Europe, Japan, China, Russia, India, South Korea, and the United States presented their current thinking on the timescale for next-step fusion nuclear facilities. The speakers advocated a remarkably consistent timeline, despite some variation in the scale and scope of the facilities being considered. All said that serious planning should begin now, leading to construction in the 2020s, i.e., in parallel with ITER operation, and operation in the late-2020s to mid 2030s. Missions considered for the next step include materials R&D, component testing, reliability and availability growth, maintenance prototyping, and electricity generation, all of which must be accomplished for a fusion Demo. All of these missions would require deuterium-tritium (DT) fusion plasma operating continuously for periods of weeks to months, tritium breeding leading to self-sufficiency, and remote maintenance. Options presented at the workshop range from fusion nuclear science facilities (FNSF) focused on materials research and component development to Pilot Plants or Demos designed to integrate the science and technology of a fusion system and demonstrate readiness for commercialization. At the same time, it was recognized that there is much to be done in smaller, more focused programs and facilities, utilizing computation and simulated environments to expedite progress, in order to develop the fusion nuclear science and technologies for integration and testing in large nuclear facilities.

ROADMAP ISSUES REQUIRING INTERNATIONAL ACTION

The workshop underscored the necessity of continuing to collaborate internationally to resolve the outstanding challenges of fusion development. The scale and complexity of these challenges demand it. A continued international commitment to the success of ITER was seen as critical both to technical progress and to the credibility of the field. New mechanisms are needed for experts to collaborate in reaching a better technical understanding of the major development issues and the options for resolving them.

Workshop participants sought to identify technical issues of high strategic importance, where the choice of development strategy strongly influences the overall roadmap, and where there are divergent understandings in the world community. The result is a short list of topics, for which there is a need and an opportunity to follow up internationally with further discussion and joint work among specialists, in order to clarify the path forward.

A. The assumptions used in fusion reactor design.

Fusion reactor designs depend sensitively on physics and technology assumptions used in the design. For example, assumptions about the bootstrap current fraction, overall current drive efficiency (wall-plug to plasma), maximum divertor heat fluxes, radiation fraction, and tokamak operation above the no-wall beta limit have high leverage on the design. Some assumptions presume large advances over the long-term. There is a need to clarify what assumptions are appropriate as a design basis for next-step facilities that could be ready to start construction in the next ten years or so.

B. The strategy for fusion materials development.

Irradiation testing is seen as a necessity, and may determine the critical path, for developing structural and first-wall materials for Demo. The fusion community has long embraced the idea of an International Fusion Materials Irradiation Facility (IFMIF) to provide a fusion-relevant neutron source, but at this time there are no plans for construction of such a facility. The irradiation testing requirements to qualify materials for next-step fusion nuclear facilities may, depending on their mission, be much less than for Demo and may be satisfied with facilities that can be made available in the near term. There is a need for fusion facility planners and materials specialists to develop a plan for materials development and facility construction that is self-consistent.

C. The strategy for blanket development.

Tritium self-sufficiency is a requirement for fusion development beyond ITER, so breeding blankets will be a necessity for essentially any next-step fusion nuclear facility, regardless of its mission. The blankets and associated tritium processing systems comprise a complex system with multiple functions, materials, loads, and environmental conditions. There is a need to devise a strategy for blanket technology development, addressing both materials and engineering issues that will lead to self-consistent solutions.

D. The strategy for plasma exhaust solution development.

The heat and particle-exhaust requirements for high-duty-factor fusion devices go well beyond those of ITER. There is a need to develop the physics and technology of plasma exhaust, including materials, divertor configurations, and operating scenarios, leading to solutions that are both self-consistent and compatible with plasma performance and tritium breeding. The roles in an optimal development strategy of existing plasma devices, new nonnuclear facilities, ITER, and future fusion nuclear devices need to be understood.

E. The requirements and state-of-readiness for next-step facilities.

Plans for next-step fusion nuclear facilities generally call for construction to start in the 2020s and proceed in parallel with ITER operation. Analyses of the status of key fusion technologies needed for such facilities indicate wide readiness

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Explains a lot

A thinking man can never be a party man.

Friedrich Nietzsche

Why there are teachers

To be good is noble, but to show others how to be good is nobler and no trouble.

Mark Twain

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gaps and a need for large development programs. A self-consistent plan for closing the gaps in time to support the facility planning schedules does not exist. While the policy environment and resource availability can vary from country to country, the question of technical readiness can be judged by the international community of fusion scientists and engineers. There is a need for national programs to develop their design options in more detail, and for the international community to begin a critical examination of both the facility plans and technology programs, and foster work that will reconcile the two.

The workshop closed with a strong consensus among participants on the need for international action to follow up on the issues identified. To give one example, there is interest within the International Atomic Energy Agency (IAEA) in fostering international collaboration aimed at identifying the steps on the roadmap to commercial fusion energy. Actions toward this end might take the form of working groups, possibly organized under IAEA auspices around the key issues described above. The biennial SOFE, with its emphasis on fusion engineering and technology issues, can also continue to provide an international forum for discussing progress and plans for fusion development. The SOFE-2013 program is being planned with these aims in mind.

Hutch Neilson can be reached via E-mail: hneilson@pppl.gov.

Gotta work for it

Action may not always bring happiness; but there is no happiness without action.

Benjamin Disraeli

Improving the Nation's K-12 STEM Education: One School's Program for Educating Future Teachers

By Julie Thompson with Ken Reid

From *Today's Engineer*, Dec. 2011

America is losing its lead in the global marketplace and it doesn't seem like it's going to change anytime soon.

This is the daunting message that was first delivered more than five years ago with the release of the National Academy of Science's (NAS) famed report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. For the first time, frightening facts—such as the drastic reduction in national research and development funding, and the disproportionate number of foreign workers receiving American engineering doctorates—seemed to create a map of America's future as they were laid out one by one.

The conclusion was undeniable. If America did not make radical advances to support innovation, it would no longer remain the world leader in science and technology. The report forced the country to face the reality of where it was heading, but it also provided a specific plan to change its course.

At the heart of its recommendation was the K-12 educational system, which lagged among industrial countries on average. NAS urged the country to take drastic action, including an annual recruitment of 10,000 science and mathematics teachers who could potentially impact and inspire 1,000 students in their field over their career.

Despite the academy's stern warnings, America is in no better shape today than it was nearly five years before, according to a follow-up report released by the academy in 2010. Still, the crisis has not gone unnoticed. Since Gathering Storm was first released, the discussion of STEM (science, technology, engineering and mathematics) education has exploded, spawning new reports on how the crisis should be handled, and creating private sector consortiums dedicated to solving the issue.

While the nation's different sectors discuss engineering education standards and invest billions of dollars into programs like engineering camps, one university has decided to address the issue where it matters most. The T.J. Smull College of Engineering at Ohio Northern University has created one of the country's first Bachelor of Science degrees in Engineering Education in an effort to educate teachers who can accurately introduce K-12 students to engineering and encourage them to enter the field.

"Now more than ever we need to provide effective exposure to engineering in the K-12 classroom and cultivate a deep desire for students to study the subject at the college level," said Ken Reid, Ph.D., director of freshman engineering at Ohio Northern. "This degree will produce the teachers needed to bridge the gap between the two."

The four-year degree, which will launch this fall, will prepare graduates to become licensed secondary math teachers but with a more specialized perspective than teachers who have a traditional education diploma. Ohio Northern believes its program will help maintain America's place as a global leader in science and technology by graduating educators who will inspire young people to become the country's next great innovators.

"Ohio Northern's Engineering Education program will produce teachers who have a fundamental knowledge of engineering," said Eric Baumgartner, dean of the T.J. Smull College of Engineering. "As such, these teachers will be in the strongest position to educate our nation's youth in engineering principles and will bring engineering to life within the classroom."

PROVIDING A PROPER INTRODUCTION

Research has shown that K-12 students are exposed to potential careers through relatives, teachers and the media, yet all three of these groups rarely hold an accurate view of what engineers actually do.

As a result, middle and high school students are often unaware of the engineering profession and misunderstand the role of engineers in society. For instance, students may think of engineers as people who fix cars rather than those who create, innovate and better society. Teachers who are unaware of the importance of engineers in society may perpetuate misconceptions, and discourage students from pursuing a career in engineering.

The American Society for Quality commissioned a market research firm to study teacher knowledge and passion for math and science. The results show that, while students consider their teachers knowledgeable about math and science, they do a poor job of discussing STEM careers and/or encouraging students toward the STEM disciplines.

For several years now, engineering advocates have put programs in place to turn the tide. Many school districts have increased the amount of in-service days to educate teachers about engineering, while industry advocate groups and universities have kicked off summer camps to help students experience the exhilaration that comes from creating with their hands and mind.

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Imagine that!

Sex appeal is 50 percent what you've got and 50 percent what people think you've got.

Sophia Loren

Haven't hurt recently. You?

One of the greater pains to human nature is the pain of a new idea.

Walter Bagehot

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Such efforts, however, provide a temporary fix and mainly reach students who are already predisposed to enter the engineering field. So, what about those who have the in-born abilities to create, but have yet to understand what engineering is all about?

"The most effective way to reach students is through the influence of a teacher who inherently integrates the principles of engineering into everyday learning," Reid says.

Reid experienced this first hand when he partnered in 2008-2009 with Christine Floyd, an Indiana middle school teacher to create *The Tsunami Model Eliciting Activity* (MEA). The curriculum was designed and implemented in a seventh-grade classroom to teach students that engineers help society. As a result, the accuracy of the student's perception of engineering significantly increased.

Better yet, since the course was required of all students, it had an impact on those who had already been exposed to engineering as well as those who had not. Examples such as this are very rare, but Reid believes it can become a norm as more engineering-minded teachers enter the nation's school systems.

Reid's involvement with K-12 programs includes a long history with the IEEE-USA Precollege Education Committee and development of the IEEE-USA K-12 STEM Activity Fund, offering resources to K-12 teachers who want to implement activities into their classroom such as lesson plans through the IEEE Teacher In-service (STEM-TISP) program.

PREPARING THE WAY

Creating new engineers isn't a luxury, but a necessity for America. While only four percent of the nation's workforce is composed of scientists and engineers, these professionals help create jobs for the other 96 percent, according to the National Science Board.

Despite its importance, engineering remains the only discipline in the STEM acronym that does not yet have its own set of national education standards. Though standardization has been greatly discussed and researched it has been determined it cannot be carried out because of its complexities.

The nation has learned from past experiences that creating national standards is no small task. Such an undertaking requires significant funding, strong leadership and the organized effort of hundreds of people over a period of several years. Moreover, experts would have to determine how engineering standards should relate to those already in place for mathematics, science and technology, according to the National Academy of Engineering.

Some argue that the issue runs deeper than the creation of the standards and really rests on whether they could be accurately measured once they were in place. In its report, *Standards for K-12 Engineering Education?*, the National Academy of Sciences concluded that while it is "theoretically possible to develop standards for K-12 engineering education, it would be extremely difficult to ensure their usefulness and effective implementation." Among its concern is the absence of a critical mass of teachers qualified to deliver engineering instruction.

Reid believes it's not a matter of if, but when engineering standards will be created. And once it does happen, schools will need qualified teachers to teach the engineering curriculum.

"We can sit on the sidelines and debate about the storm that is upon us or we can get busy addressing the issue with the resources we already have at our disposal," says Reid. "We're excited to be a part of laying the foundation for what we believe will become the future of engineering education."