

# NUCLEAR & PLASMA SCIENCES SOCIETY NEWS

A Publication of the Institute of Electrical & Electronics Engineers

Number 3, September 2012

## CONFERENCES

### 2012 IEEE Nuclear Science Symposium, Medical Imaging Conference, Workshop on Room-temperature Semiconductor X-ray and Gamma-ray Detectors



The 2012 IEEE Nuclear Science Symposium and Medical Imaging Conference, together with the Workshop on Room-Temperature Semiconductor X-Ray and Gamma-ray Detectors will be held in at the Disneyland Hotel (Anaheim, California), from October 29<sup>th</sup>–November 3<sup>rd</sup>.

This particular conference has attracted a record number of abstracts, 1805 (excluding Workshops), for NSS/MIC meetings held in the U.S. This number was bested by Dresden in 2008 with 1979, and edged by Valencia in 2011 with 1818. The conference is also truly international with only about one-third of the abstracts submitted coming from the U.S. The committee is doing an outstanding job in arranging the program and ensuring the most efficient use of the Disneyland Hotel convention spaces. With the large abstract submission we are also looking at increasing the room block at the Disneyland Hotel since the rooms are already going fast and, based on the number of abstracts submitted, we are expecting about 2100 attendees.

As with previous meetings, there will be short courses on the preceding Saturday and Sunday (October 27<sup>th</sup> and 28<sup>th</sup>) as well as on Monday. The short courses deal with detectors, electronics, basics of molecular biology for imagers, image reconstruction, and basic PET and SPECT detectors. The full descriptions are on the conference web site. On most days there will also be free refresher

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## NUCLEAR & PLASMA SCIENCES SOCIETY NEWS

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### CONTRIBUTED ARTICLES

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 October 10<sup>th</sup>, 2012 for publication in the December 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.

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## CONFERENCES

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courses in the early morning before the main scientific sessions. Full details of the program are being finalized as I write this report, so I encourage individuals to check out the web site for the program and workshop details: [www.nss-mic.org/2012](http://www.nss-mic.org/2012)

We will also be supporting access to the program, exhibitor information, venue maps, and notices for attendees using the free conference4me application which is available for download from the iTunes store for iPhones and iPads as well as from the Android store for the various versions of that platform. The content should be live on the server site that the application uses in early September and we encourage attendees who are interested to try it out and let us know your opinion of this option for the conference.

While the venue will be relaxing and offers many options when one is not attending sessions, the main purpose of this meeting continues to be the exchange of information in the many scientific and engineering disciplines represented by the attendees. The NSS portion of the conference is an ideal forum for scientists and engineers in the fields of nuclear science, radiation instrumentation, software engineering, data acquisition, and related applications to present their work and to network with their colleagues from around the world. Similarly, the MIC has consistently provided one of the most productive forums for the exchange of information on the physics, engineering, and mathematics of nuclear medicine. The MIC goes further with many contributions from other areas of medical imaging including X-ray and magnetic resonance imaging. The RTSD is an

ideal companion to both the NSS and MIC segments of the conference and impacts both interest areas. To further underscore the collaborative nature of all three of these major tracks (NSS, MIC, RTSD), there will be joint sessions on Tuesday where related papers felt to be of particular interest to all three tracks have been selected for presentation in the same sessions.

As in past years, the conference has been very successful in obtaining grants to support student attendance at this important meeting thereby allowing many students to take full advantage of this unique scientific and educational opportunity.

It takes a large number of hard-working volunteers to put this conference together and this year is no exception. The full list of the chairs of the various subcommittees is found on the web site, but this does not include the many individuals whose efforts are so important to the conference.

Overall, the traditional excellence of the NSS, MIC, and RTSD conferences will be continued, and we hope enhanced in 2012 with the combination of the outstanding presentations of current work, educational sessions, special emphasis seminars, and a venue that will promote the informal exchange of ideas and information. And, if all goes well, we should have a few other surprises along the way for the attendees. All in all, this will be a very full week.

I look forward to seeing you in Anaheim.

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General Chair*

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*(continued on page 4)*



Tom Lewellen  
General Chair

### I'm sure this is true

*It is the certainty they possess the truth that makes men cruel.*

Anatole France

## CONFERENCES



Maxim Titov  
NSS Program Chair



Ingrid-Maria Gregor  
NSS Program Deputy Chair



Vesna Sossi  
MIC Program Chair

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### THE CONFERENCE HOTEL

The meeting will be held at the Disneyland® Hotel Convention Center (Anaheim, California) with the conference room block at the Disneyland® Hotel and Disney Paradise Pier hotel. The conference rate at the hotels is \$169/night (and a limited number rooms at a student rate of \$128/night and for U.S. government employees the prevailing government rate). The rate includes a round-trip voucher for the Disneyland Resort Express bus service for one of the room occupants.

When you register on-line at one of the Disneyland® hotels, you will also have the ability to purchase discounted Theme Park tickets if you so desire. Note that these discounted tickets have to be purchased from the on-line registration system; they can not be purchased once you arrive at the hotels.

To secure a room please go the conference web site ([www.nss-mic.org/2012](http://www.nss-mic.org/2012)) and follow the links for the hotel registration.

Reservations must be made by Tuesday, September 25, 2012 or before the group rooms are sold out, so do not delay. Prevailing rates may apply after this date or when the group rooms are sold out, whichever occurs first. Rooms are subject to availability.

### TRANSPORTATION

Airports: The closest airport is the Santa Ana airport (also known as the John Wayne airport). For direct international flights, the best airport is Los Angeles International airport (LAX). These airports are served by the Disneyland Resort Express bus service. There are also options for taxis, ride-share vans, and public transport. Details on transportation options (including other airports and train stations)

can be found at: <http://disneyland.disney.go.com/plan/guest-services/transportation/>

### SCIENTIFIC PROGRAM

It is not possible in limited space to give full details of the program, so the reader is directed to the conference web site (<http://www.nss-mic.org/2012>) for complete details of all the topics and sessions. We have accepted over 1700 outstanding paper contributions that will be presented in both oral and poster formats. Brief descriptions of the individual programs follow.

### NUCLEAR SCIENCE SYMPOSIUM

The IEEE Nuclear Science Symposium (NSS) offers an outstanding opportunity for scientists and engineers interested, or actively working in the fields of nuclear science, radiation detection, high-energy physics and astrophysics. The scientific program provides a comprehensive review of the latest developments in technology and covers a wide range of applications from radiation instrumentation and new detector materials to complex detector systems for physical sciences and advanced imaging systems for biological and medical research. The NSS program consists of plenary, parallel, and poster sessions. The basic NSS topic areas are:

- Analog and Digital Circuits
- Astrophysics and Space Instrumentation
- Accelerators and Beam Line Instrumentation
- Computing and Software
- Data Acquisition and Analysis Systems
- Gaseous Detectors
- High Density Detector Processing and Interconnect Technologies
- Homeland Security
- Nuclear Measurements and Monitoring Techniques
- Nuclear Physics Instrumentation

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- High Energy Physics Instrumentation
- Instrumentation for Radiation Applications in Medicine
- New Solid-state Detectors
- Neutron Instrumentation
- Photon Detectors and Radiation Imaging Detectors
- Radiation Damage Effects
- Scintillators and Scintillation Detectors
- Semiconductor Tracking and Spectroscopy Detectors
- Synchrotron Radiation and FEL Instrumentation
- Trigger and Front-end Systems
- Nuclear Power

As a part of the NSS Symposium, a special Linear Collider (LC) event will be held on October 29<sup>th</sup> and 30<sup>th</sup> which will include presentations on the International Linear Collider (ILC) and Compact Linear Collider (CLIC) accelerator designs as well as detector concepts, the potential impact of the LC technologies for industrial applications and a forum discussion about future LC perspectives.

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### MEDICAL IMAGING CONFERENCE

The Medical Imaging Conference (MIC) is the foremost international scientific meeting on the physics, engineering and mathematical aspects of nuclear medical imaging. Multimodality approaches are now well accepted in the field. The content of the MIC reflects this, with a growing emphasis on the methodologies of X-ray, optical, ultrasound and MR

imaging as they relate to and complement nuclear imaging techniques. In addition, specialized topics will be addressed in the Short Courses. The basic topic areas are:

- Emission Tomography Instrumentation (PET, SPECT)
- Other Medical Imaging Technologies (CT, MR, Optical, Ultrasound, etc.)
- Multimodality Systems
- High Resolution and Preclinical Imaging Instrumentation, Techniques and Systems
- Intraoperative Probes and Portable Imaging Systems
- New Detector Materials/Technologies for Medical Imaging
- Image Reconstruction Methods
- Data Corrections and Quantitative Imaging Techniques
- Simulation and Modeling of Medical Imaging Systems
- Data Acquisition and Signal Processing
- Image Processing and Parametric Imaging
- Imaging in Radiotherapy

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### 19<sup>TH</sup> WORKSHOP ON RTSD X-RAY AND GAMMA-RAY DETECTORS

The 19<sup>th</sup> International Workshop on Room-Temperature Semiconductor Detectors (RTSD) represents the largest forum of scientists and engineers developing new semiconductor radiation detectors and imaging arrays. Room-

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*Alex Converse*  
MIC Program Deputy Chair



*Jennifer Huber*  
Short Course Program Chair (MIC)



*Ralph B. James*  
RTSD Cochair

## CONFERENCES



Michael Fiederle  
*RTSD Cochair*



Bo Yu  
*Publications Chair*



Stephen E. Derenzo  
*Short Course Program Chair (NSS)*

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temperature, solid-state radiation detectors for X-ray, gamma-ray, and neutron radiation are increasingly finding applications in diverse fields, such as medicine, homeland security, astrophysics and environmental remediation. The objective of this workshop is to provide a forum for discussion of the state of the art in the development of photoconductive materials for radiation detection, material and detector characterization, device fabrication processes, electronics and applications. Oral and poster presentations representing a broad spectrum of research activities emphasizing either device or material understanding are included. The basic topic areas are:

- Semiconductor Materials for Radiation Detection
- Organic and other Photoconductive Materials for Radiation Detection
- Crystal Growth, Materials and Defects Characterization
- Strip, Pixel and Discrete Semiconductor Detectors
- Properties of Electrical Contacts and Device Fabrication Technology
- Radiation Damage, Long-Term Stability and Environmental Effects
- Scintillator/Semiconductor Array Hybrids
- Solid-state Neutron Detectors
- Detector/ASIC Hybridization, Interconnects and Electronics
- Spectrometer Systems for Homeland Security, Nuclear Inspections Safeguards and Portal Monitoring
- Imaging Systems for Medical, Astrophysics, Nondestructive Testing and Cargo Monitoring Applications

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### SHORT COURSES OFFERED:

#### Radiation Detection and Measurement

Sat., Sun., October 27<sup>th</sup> and 28<sup>th</sup>

#### Nuclear Science for Nuclear Security

Sat., October 27<sup>th</sup>

#### Integrated Circuit Front Ends for Nuclear Pulse Processing

Sat., October 27<sup>th</sup>

#### Advanced Photodetectors

Sun., Oct., 28<sup>th</sup>

#### Molecular Biology for Imaging Scientists

Sun., Oct., 28<sup>th</sup>

#### Physics and Design of Detectors for SPECT and PET

Sun., Oct., 28<sup>th</sup>

#### Medical Image Reconstruction

Mon., Oct., 29<sup>th</sup>

Details can be found on the conference web site.

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### PUBLICATIONS

The title and authors of accepted papers will appear in the Conference Program Handbook. Abstracts will be contained in USB memory sticks and given to attendees at registration. Full paper texts will be published in the Conference Record, an unrefereed conference proceedings, available only on CD-ROM. Prior to the mailing of the CD-

## CONFERENCES

ROM, the conference papers will be posted to the conference web site.

In addition, authors may submit their papers to the conference issue of the *IEEE Transactions on Nuclear Science* (TNS). This is a peer-reviewed journal with significant distribution within the nuclear science and medical imaging communities. All IEEE/NPSS member participants will receive a complimentary copy of the conference issue of the TNS. Alternatively, relevant papers may be submitted independently to the *IEEE Transactions on Medical Imaging* (TMI). There is no special conference issue. Details are listed on the conference web site.

*Bo Yu*  
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### COMMERCIAL EXHIBITS

Vendors with products and services related to the NSS, MIC, and RTSD are invited to participate in the Industrial Program which comprises an exhibition and technical seminars. An exhibition area central to conference activities will be provided to display the latest in products and innovation. Exhibits will be in the same room as the poster sessions and where the coffee will be served.

With the excitement over the LHC, other high energy physics experiments, new medical imaging instruments, and instruments for homeland security, the attendance at the IEEE NSS-MIC has been steadily increasing. Attendees are invited to visit the more than 40 booths in the exhibition area and the technical seminars to learn about the newest products. Details can be found on the conference web site.

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### COMPANION PROGRAM

The companion program for the attendees will also offer a wide range of options with tours and events from Sunday, October 28<sup>th</sup> through Saturday, November 3<sup>rd</sup>. The tours include off-site trips to:

**Bowers Museum of Cultural Art**  
Sunday, October 28<sup>th</sup>

**Mission San Juan Capistrano**  
Monday, October 29<sup>th</sup>

**San Diego Zoo Safari Park**  
Tuesday, October 30<sup>th</sup>

**Tour of the Queen Mary**  
Wednesday, October 31<sup>st</sup>

**Wine education/blend your own bottle**  
Thursday, November 1<sup>st</sup>

**Crystal Cove nature hike**  
Friday, November 2<sup>nd</sup>

**Nixon Library and Old Town Orange**  
Saturday November 3<sup>rd</sup>

Two behind-the-scenes tours within the Disney parks:

**Tour of the pyrotech launch area for the nightly fireworks**  
Wednesday, October 31<sup>st</sup>

**Animation shop**  
Friday, November 2<sup>nd</sup>.

Full details and costs are on the web site. Most tours will include a breakfast at the companion program room at the Disneyland hotel before the day's events.

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### GENERAL CONFERENCE EVENTS

In addition to the plenary sessions for NSS, MIC, and RTSD there will

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*Ronald M. Keyser*  
*Commercial Exhibits Chair*



*Robert G. Finnegan*  
*NSS-MIC Exhibition Manager*



*Barbara Lewellen*  
*Companion Program Chair*

## CONFERENCES



Christina Sanders  
Registration Chair

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be special events such as the Gold Reception and Women in Engineering (WIE) sessions (see the program or the conference web site for time and dates). There will also be optional lunches on Monday (NSS), Tuesday (RTSD), and a MIC dinner on Friday (to attend these, add the option when you register). The NSS lunch will feature John Knoll who will talk about art and science in Visual Effects. The RTSD lunch is planned at a venue in Downtown Disney while the MIC dinner is planned to take place within the California Adventure park.

In addition, all attendees are invited to the exhibitors' reception on Tuesday evening and the general conference reception on Wednesday evening.

Times and locations can be found in the program book and on the conference web site.

### REGISTRATION

All registration formalities for participants are again being handled electronically through the conference web site at <http://www.nss-mic.org/2012>. Participants can register for the conference, Short Courses, Workshops, Tours, NSS and RTSD lunches, MIC dinner, and the Companion Program, as well as request hotel accommodations. Payment may be made in several convenient ways.

Christina Sanders  
Registration Chair  
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## 2013 IEEE NSREC is Planning for San Francisco



The 50<sup>th</sup> IEEE Nuclear and Space Radiation Effects Conference will be held July 8<sup>th</sup>-12<sup>th</sup>, 2013, at the Hyatt Regency San Francisco. 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, an up-to-date Short Course offered on July 8<sup>th</sup>, a Radiation Effects Data Workshop, and an Industrial Exhibit. Jeff Black, Sandia National Laboratories, is Chair.

### SAN FRANCISCO

San Francisco is often called "Everybody's Favorite City," due to its scenic beauty, cultural attractions, diverse communities, and world-class cuisine. Measuring 49 square miles, this walkable city is dotted with landmarks such as the Golden Gate Bridge, cable cars, Alcatraz and the largest Chinatown in the United States. A stroll of the city's streets can

lead to Union Square, the Italian-flavored North Beach, Fisherman's Wharf, and the Mission District, with intriguing neighborhoods to explore at every turn.

Views of the Pacific Ocean and San Francisco Bay are often laced with fog, creating a romantic mood in this most European of American cities. The city is home to world-class theatre, opera, symphony and ballet companies and often boasts premieres of Broadway-bound plays and culture-changing performing arts. San Francisco is one of America's greatest dining cities. The diverse cultural influences, proximity of the freshest ingredients and competitive creativity of the chefs result in unforgettable dining experiences throughout the city.

Luxury and location converge in perfect balance at the Hyatt Regency San Francisco. At the only AAA Four Diamond hotel in downtown



## CONFERENCES

San Francisco situated right on the Embarcadero waterfront, guests will enjoy immediate access to both the Financial District and the city's most famous attractions. You'll find the historic Ferry Building on one side of our expansive San Francisco, California hotel, the ferry to Alcatraz and the Bay on the other, and stunning views all around.

Supporters of the conference include the Defense Threat Reduction Agency, Sandia National Laboratories, Air Force Research Laboratory, NASA Electronic Parts and Packaging Program, Jet Propulsion Laboratory, Aeroflex, Atmel, Boeing, BAE Systems, Honeywell, Intersil, International Rectifier, Northrop Grumman, Southwest Research Institute, Synopsis, Texas Instruments and NASA Living with a Star

### TECHNICAL PROGRAM

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

*Note: All conference attendees will receive a special DVD-ROM containing the IEEE publications from all previous conferences (1964-2012). All papers will be linked to other papers that are referenced and cited. Papers will also be searchable via year, session, and author.*

The conference committee is soliciting papers describing significant new findings in the following or related areas:

- Basic Mechanisms of Radiation Effects in Electronic Materials and Devices

- Radiation Effects on Electronic and Photonic Devices and Circuits
- Space, Atmospheric and Terrestrial Radiation Effects
- Hardness Assurance Technology and Radiation Testing
- New Developments of Interest to the Radiation Effects Community

### RADIATION EFFECTS DATA WORKSHOP

The Radiation Effects Data Workshop is a forum for papers on radiation effects data on electronic devices and systems. Workshop papers are intended to provide radiation response data to scientists and engineers who use electronic devices in a radiation environment, and for designers of radiation-hardened or radiation-tolerant systems. Papers describing new simulation facilities are also welcomed.

### PAPER SUBMITTAL

Information on the submission of summaries to the 2013 NSREC for either the Technical Sessions or the Data Workshop can be found at [www.nsrec.com](http://www.nsrec.com). The deadline for submitting summaries is February 1, 2013.

### SHORT COURSE

Attendees will have the opportunity to participate in a one-day Short Course on Monday, July 8<sup>th</sup>. The theme for the 2013 short course is "Evolution of Radiation Studies on the Path of Moore's Law: Past, Present and (Foreseeable) Future," and is being organized by Alessandro Paccagnella, DEI- Padova University. The course will be of interest both to radiation effects specialists and newcomers to the field alike.

### INDUSTRIAL EXHIBIT

An Industrial Exhibit will be included as an integral part of the conference and chaired by Marc Owens, AFRL/RVSE. The exhibit will be held on

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### I'm sure that...

*Convictions are more dangerous enemies of truth than lies.*

Friedrich Wilhelm Nietzsche



Teresa Farris  
Radiation Effects Vice Chair, Publicity

## CONFERENCE REPORTS

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Tuesday and Wednesday. It will include exhibits from 50-65 exhibitors who represent companies or agencies involved in manufacturing electronic devices or systems for applications in space or nuclear environments, modeling and analysis of radiation effects at the device and system level, and radiation testing.

### CONFERENCE COMMITTEE

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#### Awards

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#### Industrial Exhibits

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Stefan Ritt  
*CANPS Chair*

## Real-Time Conference 2012

The 18<sup>th</sup> IEEE Real-Time Conference (RT12) took place from June 11<sup>th</sup> to 15<sup>th</sup> at the Shattuck Plaza Hotel in downtown Berkeley, California. It was organized by the Lawrence Berkeley National Laboratory under the chairmanship of Sergio Zimmermann.

There were 207 registrants in total, which was slightly more than at RT10 in Lisbon, Portugal. Many abstracts came from China (39), USA (36), Germany (28) and Switzerland (21), followed by Italy (13), Poland (12), Portugal (9) and Japan (9). The remaining abstracts were shared among various countries in Europe and Asia. The large number from China is related to the fact that RT09 took place in Beijing, and shows that IEEE conferences can successfully expand to Asia and then sustain Asian attendance even at conferences taking place outside of Asia.

Our now-traditional ATCA workshop organized by Ray Larsen, along with Zheqiao Geng from SLAC and Sergio Zimmermann from LBNL was held during the weekend before the conference. Two short courses were held, one given by Mariano Ruiz from the Technical University of Madrid on data acquisition systems and one by Hemant Shukla on data analysis with fast graphics cards (GPU).

All poster presenters could again opt for a “mini-oral” presentation. This time each presentation was limited to two minutes, which helped the authors in focusing on the highlights of their posters. The poster sessions were divided into four one-day sections. This way only the posters which were covered by the corresponding mini-oral just before the poster session were shown. With the mini-oral presentation still fresh in mind, delegates could then seek the appropriate author during the following poster session; this stimulated lively and intensive discussions.

## CONFERENCE REPORTS



Poster sessions at RT2012 encourage active participation.

The technical program was organized by our program chair Réjean Fontaine with the help of Patrick Le Dû. Each session started with an invited introductory talk. A new track has been created dealing with upgrades of existing systems, mainly related to LHC experiments at CERN.

Special efforts were made to stimulate good student contributions. Awards were given to the three best student papers. Due to the promotion on the conference web site, we had many more applicants than at previous RT conferences.

A highlight of the Real-Time Conference is the presentation of the CANPS prize. It is given to individuals who have made outstanding contributions in the application of computers in nuclear and plasma sciences. This year, the award committee, chaired by Jean-Pierre Martin, awarded the prize to Christopher Parker for “Outstanding development and user support of modular electronics of the instrumentation of physics applications.” For details please see the Awards section under **Functional Committees** (p. 27).

The social program contained an excursion to two wineries in the Sonoma valley including visits to their cellars. The conference dinner took place at

the Berkeley Art Museum. This was a very special event since the museum was closed to the general public that evening, so the whole museum was ours.

A special issue of *IEEE Transactions on Nuclear Science* (TNS) will be published to include eligible contributions from RT12. Sascha Schmeling (CERN) is Senior Editor.

The 19<sup>th</sup> Real-Time Conference will take place in spring 2014. We follow our traditional cycle Europe-North America-Asia, and with RT10 in Lisbon, Portugal and RT12 in Berkeley, California, RT14 will return to Asia to be hosted by Masaharu Nomachi of the University of Osaka at the beautiful deer park inside the city of Nara, Japan. We are working to involve different Japanese and Chinese institutions in order to spread the knowledge of this conference and to increase the attendance. For RT16 we will go again to Europe, probably to some nice place in Italy.

*Stefan Ritt, chair of the Computer Applications in Nuclear and Plasma Science Technical Committee, can be reached at the Paul Scherrer Institute, CH-5232 Villigen, Switzerland. Phone +41 56 310 3728; E-mail: stefan.ritt@psi.ch*

### But not as deadly!

*Computers have enabled people to make more mistakes faster than almost any invention in history, with the exception of tequila and handguns.*

Mitch Ratcliffe

### Then there's good and bad

*There are two kinds of science, applied and not yet applied.*

George Porter



Janet Barth  
IEEE NPSS Vice President/  
President-elect

## Vice President's Report

The IEEE Marie Sklodowska-Curie Award is one of the highest IEEE awards—a Field Award—that was established by the Nuclear and Plasma Sciences Society in August 2008. It was first presented to Ned Birdsall in 2011 and is presented annually to an individual or to individuals on a team or multiple recipients, up to three in number, for outstanding contributions in the fields of nuclear and plasma sciences and engineering. The areas of technology that are eligible for recognition though this award are those associated with nuclear and plasma sciences and engineering. This covers a fairly broad scope of activities, but the unifying themes are ionizing radiation and ionized gases, especially their behavior, measurement and effects. Specific areas include, but are not limited to, radiation instrumentation, radiation effects, nuclear medical imaging, plasma science, pulsed power, particle accelerators, controlled nuclear fusion, and computer applications. Criteria considered by the IEEE Marie Sklodowska-Curie Award Selection Committee include importance of individual scientific contributions, importance of scientific contributions made by teams led by the candidate, seminal nature of the contributions, innovation/originality, societal benefit, impact on the profession and the quality of the nomination. The award nominations are due each year on January 31<sup>st</sup>. The award submission deadlines can be found at [http://www.ieee.org/about/awards/awards\\_guidelines.html](http://www.ieee.org/about/awards/awards_guidelines.html).

The NPSS AdCom is proud to announce the presentation of the second annual IEEE Marie Sklodowska-Curie Award to Prof. Gennady Andreevich Mesyats at the 2012 International Conference on Plasma Sciences in Edinburgh, Scotland in July 2012. The NPSS and the Technical Field Awards Council of

the IEEE Awards Board recognized Prof. Mesyats for “founding the field of nanosecond pulsed power and for seminal contributions to the physics of vacuum breakdown at high power levels.” Prof. Mesyats is the Director of the Lebedev Physics Institute, Russian Academy of Sciences, and is the Vice President of the Russian Academy of Sciences, Moscow, Russia. On behalf of the NPSS AdCom, I extend warm congratulations to Prof. Mesyats for attaining the highest recognition of his remarkable achievements.

I am pleased to announce that in March 2012 Dr. Sal Portillo from the University of New Mexico was appointed to the NPSS AdCom as our new Membership Chair. Under the guidance of Jane Lehr, a former NPSS President and Membership Chair, Sal has made a fine start, having already led membership activities at his first conferences. He is eager to share new ideas about how to best recruit and retain new members. I would like to thank Sal and all other NPSS members who are helping him, including the Chair and members of our Communications Committee who facilitate the set-up of the NPSS membership booths, the members of the conference community who staff the NPSS booth, and especially Vernon Price who is of extraordinary help in processing new applications. I also appreciate the support from Patrick Le Dû and Jean-Luc Leray for championing IEEE/NPSS membership in IEEE regions 8 through 10.

In addition to conferences, Chapters play a vital role in member participation in the NPSS. We currently have eighteen active chapters and joint chapters, nine in North America, six in Europe and three in Asia. Over the past two years, chapters were established in Richland, Washington; Toronto, Canada; the Czechoslovakia

### New danger

*Every public action which is not customary either is wrong or, if it is right, it is a dangerous precedent. It follows that nothing should be done for the first time.*

F. M. Cornford (in 1908)

Section; and in Vancouver, Canada (a combined Chapter of the IM, MAG, Nuclear and Plasma PS, and UFFC Societies). Most recently a Chapter was formed in Singapore under the leadership of Ricky Ang. Our Chapter Chairman, Steven Gold, reports that there is also chapter interest in Beijing, China; Puerto Rico; Costa Rica; and South Africa which indicates that the IEEE NPSS community is growing all across the world.

Steven Gold is also responsible for leading the NPSS Distinguished Lecturers (DL) Program. Currently, there are 26 lecturers offering 44 lectures. NPSS Chapters and IEEE Sections and Student Chapters are eligible to take part in the NPSS Distinguished Lecturers Program, which provide highly qualified lecturers from all of the NPSS Technical Committees to chapter meetings at no cost to the chapter or section. In addition, the NPSS Distinguished Lecturers are available for presentations to other IEEE

entities as well as selectively to non-IEEE organizations, such as universities.

I am also pleased to report that, at our March 2012 meeting, the AdCom voted to extend NPSS support of the DL Program to Summer Schools supported by the members of the NPSS community. Summer Schools have been held in Beijing and the Ukraine and are being organized in Brazil, India, and Vietnam. The Summer Schools are generally held before national and international events, including IEEE conferences, and provide an opportunity for IEEE members to present the opportunities and benefits of IEEE membership to our future leaders. A new DL brochure was prepared in 2011 to publicize the program and is being distributed at 2012 NPSS conferences.

*Janet Barth, NPSS Vice-President, can be reached at the Electrical Engineering Division, NASA Goddard Space Flight Center, Greenbelt, MD, 20771, Phone: +1 301-286-5118; E-mail: barthjm@nasa.gov.*

## Secretary's Report

The IEEE NPSS Administrative Committee held its second meeting of 2012 at the Hilton Grosvenor Edinburgh on Saturday, July 7<sup>th</sup>, just before the start of the 2012 ICOPS conference. Edinburgh attracted an above-average number of ICOPS abstracts and it is anticipated that this will be an extremely successful meeting under the leadership of Dr. Michael Kong.

Ron Keyser, NPSS Treasurer, reported that the society is doing well financially except in forecasting income and expense. Part of the problem stems from conferences closing their books slowly so actuals appear to be lower than they actually are. Only periodicals and conferences produce income and

periodicals are on track. Even though conference closings are behind, our financial picture is healthy. However, NPSS net worth has remained stable, with no increase, over the past four years. In these days of economic downturn this is a reasonable position.

Two 2009 conferences finally closed this March, one 2010 conference is in audit and three 2011 conferences are still unclosed. One of our biennial conferences, Pulsed Power, has shown a loss in both 2009 and 2011. Our other conferences have all met budget.

NPSS president Bob Reinovsky reported on the TAB meeting that

*(continued on page 14)*

### Fateful encounter

*My wife and I were happy for 20 years. Then we met.*

Rodney Dangerfield



Albe Larsen  
NPSS Secretary and Newsletter Editor

### Must be elsewhere

*The future is already here—it's just not very evenly distributed.*

William Gibson

### Survival in politics

*Sometimes a man wants to be stupid if it lets him do something his cleverness forbids.*

John Steinbeck

*(continued from page 13)*

ended only a few days before our meeting. In particular, discussion of Open Access and where IEEE will go was paramount. The issues are how we will do business under a new paradigm while maintaining the very high quality, including our excellent review process, of our publications. IEEE will announce some changes in the fall. Watch for these.

Division IV Director Peter Clout talked about the success of the more formal Division IV presidents' luncheons he has organized. He is looking for ways for Division AdCom meetings to possibly be collocated to save money with greater bargaining power. The societies are quite different. The MTT AdCom meeting, for example, had 40 members and 20 observers at its meeting. The society only organizes one major conference, but attendance is in the nine to ten thousand person range. They require their Distinguished Lecturers to write articles for their magazine and to help promote the society. Each society has the potential to learn from the others in the Division.

### TECHNICAL COMMITTEE REPORTS

Stefan Ritt, chair of the Computer Applications in Nuclear and Plasma Sciences committee presented a very comprehensive overview of the 2012 Real-Time Conference. Attendance was on target at just over 200. There were slightly fewer attendees than expected because of problems several Chinese delegates had in obtaining visas. All in all the conference was a great success. Read Stefan's report in the Conference Reports section (p. 10) and the report on CANPS awards in the Awards section (p. 27).

Dennis Youchison reported that the Fusion Standing Committee had a teleconference shortly after our last AdCom meeting that reviewed the meeting and noted the end of discussion

of technical cosponsorship of the ANS Topical Conference on Fusion Technology (TOFE). Read Dennis's report under **Technical Committees** (p. 19) for more detail.

The Radiation Instrumentation Steering Committee chaired by Ed Lampo and the Nuclear Medical and Imaging Steering Committee chaired by Suleman Surti, are both holding elections for steering committee members. Both have slates of candidates that meet the IEEE requirement of 1.5 candidates per seat.

Preparations for NSS/MIC 2012 are well in hand (see cover story). With the largest abstract submittal ever for a U.S. NSS/MIC conference, attendance is expected to exceed 2100. Record funds have also been raised to support student attendance. Nominations for the Technical Committee awards closed on June 30<sup>th</sup> and the committees will announce recipients at the meeting.

The 2013 NSS/MIC will be held in Seoul, South Korea. The conference contracts are in place and committees being formed. NSS/MIC 2014 will be held in Seattle, WA with Tony Lavietes as General Chair; the site for 2015 will be decided in September, in time for the December Newsletter, and the 2016 NSS/MIC will be held in Strasbourg, France, with Maxim Titov of CEA-Saclay as General Chair.

NMISC will elect one new AdCom member this year since Tom Lewellen is completing his term. Three candidates are standing for this seat and the winner will be announced in the December Newsletter. Read Suleman Surti's report under **Technical Committees** (p.20).

Radiation Instrumentation also sponsored the Symposium on Radiation Measurements and Applications conference, held in Oakland, CA this past May. The conference had 550 attendees, below the 625 estimated, in part because of funding cuts in the

Domestic Nuclear Detection Office. Nonetheless, the conference technical content was at a very high level.

There is ongoing discussion of the relationship of RTSD to NSS/MIC.

Stan Schriber, chair of the Particle Accelerator Science and Technology Technical Committee, reported on the first North American IPAC held in New Orleans in May. Attendance was 1200 and there were 81 industrial exhibits. Three subcommittees representing Asia, Europe and North America selected students to receive the \$160K received for support. Stan emphasizes the importance of reading hotel contracts carefully. They had problems with the Hilton registration, but were covered under their contract.

An MOU is being developed for IEEE NPSS technical cosponsorship of Asian IPACs. There is an international group working to form a new commission under IUPAP for accelerator physics. The 2013 PAC will be held in Pasadena, CA beginning September 29<sup>th</sup>. The next North American IPAC will be in 2015 in Richmond, VA.

Brendan Godfrey, chair of the Plasma Science and Applications Technical Committee reported that ICOPS 2012 was ready to start on July 8<sup>th</sup> in Edinburgh with Michael Kong as General Chair. A large number of abstracts has been received but preregistration is low. The Plasma Medicine short course is popular. Peter Staecker, IEEE President-elect, will present the Maria Sklodowska-Curie Field Award to Gennady Mesyats; Mounir Laroussi will be presented the NPSS Merit Award; Andrew Ng will receive the PSAC award and Boaz Rubenstein will receive the Outstanding Student Award. See the June 2012 NPSS Newsletter for more information.

ICOPS 2013 will be a joint conference with Pulsed Power (PPST) and will be

held in San Francisco, CA. ICOPS 2014 will be held in Washington, DC with Joe Shumer as General Chair and ICOPS 2015 will be held in Anatolya, Turkey with Lutfi Oksuz as General Chair.

Brendan also noted that the OMB is requesting all federal agencies to reduce travel to 70% of the 2010 level. The U.S. Department of Defense is limiting conference expenses to \$100,000 per conference. These two actions may have a significant impact on U.S. attendance at our conferences (for example, in 2011 18% of the registrants were U.S. government employees) and may be one reason for low preregistration at ICOPS 2012.

PSAC has signed a Master Service Agreement with IEEE's MCM for providing conference support.

Mark Crawford reported for Jane Lehr that the 2009 Pulsed Power conference has closed and the 2011 conference is near closure. In 2013 there will be a joint Pulsed Power Plasma Science conference (PPST) to be held in San Francisco. Mark Crawford and John Verboncoeur are technical program cochairs. Bryan Oliver is General Chair and Jane Lehr will be treasurer. There will be minicourses on the weekend between the SOFE and PPST conferences, a banquet and possibly a tour of the NIF facility at the Lawrence Livermore National Laboratory.

Pulsed Power is also the cosponsor of the 2012 Megagauss conference (Megagauss14) to be held in October in Maui. Gerry Degnan is General Chair.

Pulsed Power is considering its first non-North American conference in 2017 with London as the possible venue. Mark Sinclair is expected to be General Chair. This may be another PPST conference.

Dan Fleetwood, chair of the Radiation Effects Technical Committee, noted that

*(continued on page 16)*

### And they never will

*The power of accurate observation is commonly called cynicism by those who never got it.*

George Bernard Shaw

### Burning imagination

*I never give them hell. I just tell them the truth and they think it's hell.*

Harry S. Truman

**And disregard election promises**

*The first lesson of economics is scarcity: There is never enough of anything to satisfy all those who want it. The first lesson of politics is to disregard the first lesson of economics.*

Thomas Sowell

*(continued from page 15)*

NSREC would be held July 16<sup>th</sup> to 20<sup>th</sup> in Miami, Florida. At the last moment the hotel began renovations. General Chair Ken LaBel and ETC's Anne Meadows are working on how to handle this potential source of disruption. All other aspects of the conference are on track, including good support and sold-out exhibits.

The next NSREC, the 50<sup>th</sup>, will be held in San Francisco and many special events are being planned to celebrate. NSREC goes to Paris in 2014, its first off-shore conference. RADECS will not be held in 2014. Dan's term ends at the end of the year and Marty Shaneyfelt becomes the new chair. Allan Johnston will be Executive Vice Chair and Pascale Gouker will become secretary.

**FUNCTIONAL COMMITTEES**

Bill Moses, Chair of both the NPSS and the IEEE conference committees, noted that with the economy still struggling and with big budget pressures on both corporations and the government, conference attendance is down. The historical tools used to

estimate conference attendance aren't working in this environment.

The ICX conference software has been rolled out for conferences now being initiated. It will generate MOUs and also notify local sections. Publication-related elements of the package will roll out at the end of the year. This replaces the 25-year-old conference management system now in use.

CrossCheck, a plagiarism detection tool, will now be used on all conference proceedings. It is already in use for journals. The software is also available to use on abstracts, so if you are the chair of a conference technical program committee, you might think about its use. Contact Bill Moses ([wmmoses@lbl.gov](mailto:wmmoses@lbl.gov)) or Paul Dressendorfer, Publications Chair ([dressepv@SWCP.com](mailto:dressepv@SWCP.com)) for further information.

In future all financially sponsored conferences will be required to use ICX. One problem still to be resolved is handling split currency conferences, e.g., a conference held in Europe with fees in Euros, but concentration banking in the U.S. with dollars as the banking

**IEEE FELLOW CANDIDATES Nominations Due March 1<sup>st</sup>, 2013 for Fellow Class of 2014**

Nominate a worthy colleague for elevation to the prestigious rank of IEEE Fellow. Requirements and nomination forms can be found at [http://www.ieee.org/membership\\_services/membership/fellows/fellow\\_nomination\\_forms.html](http://www.ieee.org/membership_services/membership/fellows/fellow_nomination_forms.html). See the NPSS web site for information on preparing good nominations.

Contact Jane Lebr ([jmlebr@sandia.gov](mailto:jmlebr@sandia.gov)) for additional information.



Membership desk at ICOPS 2012 in Edinburgh. Note new banners for NPSS and for Community Solutions Initiative.



currency and so on. Also expect to see major changes in the rules for technical cosponsorship of conferences. The new rules are being finalized and will go into effect in 2014. There will certainly be changes in what is accepted into Xplore from technically cosponsored conferences in order to maintain a high quality standard for IEEE publications.

The Awards committee has announced that Veljko Radeka of Brookhaven will be the 2013 Curie Award recipient. Congratulations, Veljko!

Sal Portillo of the University of New Mexico is our new Membership chair and we were delighted to welcome him at this meeting. Sal has worked the membership desk at the Power Modulator conference where 10% of the attendees were recruited as either new IEEE or NPSS members and was in Edinburgh to help at the desk at ICOPS. Sal is interested in the Conference Information and Promotion (CIP) process used by NSS/MIC and has numbers of other new ideas to increase membership, especially among students and young scientists by increasing the value of IEEE NPSS membership.

Steve Gold, with responsibility for Chapters, Local Activities and Distinguished Lecturers (DLs) noted that we have 20 chapters of which 18 are active. There has been interest in Beijing but the chapter hasn't formed yet. There have been no other chapter formation inquiries in the last six months.

There are, at present, 26 Distinguished Lecturers offering over 40 different lectures in the fields of nuclear and plasma sciences. There is funding available to bring a DL to your NPSS chapter or local section or student chapter. Take a look at the list at <http://ewh.ieee.org/soc/nps/lecturers.html> and invite someone soon!

In 2012 our number of Fellow candidates has fallen to about 60% of the usual pool.

Now is the time to start thinking about colleagues who deserve the prestigious status of Fellow.

Nominations chair, Craig Woody, has full slates for all TC and AdCom positions. The elections will again be electronic and will, by the time you receive this, be close to completion. Vote for the members of your technical community who will represent you, and also vote for the best AdCom members to run our society. Your vote does count.

This is also the year in which voting members of AdCom elect our vice president/president elect for 2013 and 2014. That election will be held prior to our Annual Meeting on November 3<sup>rd</sup> and the results will be announced in the March 2013 Newsletter. We are in the rare position of having four candidates!

Publications Committee chair, Paul Dressendorfer, noted that IEEE is working hard to fix problems with materials missing in Xplore. Both TNS and TPS from 1974 are missing as are 18,000 articles from some 70 journals. This is a manual process so time consuming. Paul noted that a new electronic open access journal will be launched by IEEE in the fall. The cost to authors to have papers in Open Access is expected to fall. TPS and TNS are both doing well. Steve Gitomer, TPS Editor-in-Chief, will publish 10 special issues in 2012.

Peter Clout, head of the NPSS Communications Committee, reminded us that 2013 is the time for a new brochure and we need new photos of people at work, people at conferences, experiments – all at high resolution. New trifold leaflets for 2013 will discuss *How to Volunteer, the IEEE Organization, Publishing: How we operate*. If you see a need or have an idea, please share it with Peter ([clout@vista-control.com](mailto:clout@vista-control.com)) or me.

*(continued on page 18)*

### Waste not, want not?

*In this world there are only two tragedies. One is not getting what one wants, and the other is getting it. The last one is much the worst.*

Oscar Wilde

### Room for imagination

*Statistics are rather like bikinis: what they reveal is suggestive, what they conceal is vital.*

Aaron Levenstein

**Thanks for the memory...**

*Some people do not become thinkers simply because their memories are so good.*

Friedrich Nietzsche

**Ditto for men and boys**

*Inside every older woman is a young girl wondering what the hell happened.*

Cora Harvey Armstrong

*(continued from page 17)*

Christoph Ilgner, the Graduates of the Last Decade (GOLD) chair, noted that 15% of our members are in the GOLD category. There is a GOLD trifold leaflet available describing this program and for conferences with GOLD events there are invitations at registration.

Jean-Luc Leray, Chair of the Transnational Committee, announced that a new storage and shipping facility outside Paris is now available to store and ship NPSS literature and banners for European conferences. Once new brochures are printed a large supply will be shipped to the facility and these will then be shipped within Europe as appropriate. Jean-Luc concludes his term as TNC chair this year and there are two candidates to replace him on AdCom, Patrick Le Dû, our Transnational Conferences liaison, and Zhen-An Liu, from IHEP in Beijing – the first Asian who might lead the TNC. Zhen-An has been very active with the Real-Time conference (CANPS) and NSS.

The Transnational liaison, Patrick Le Dû, has been involved with four non-North American conferences in 2012—in the UK, China, France and Germany. The schedules for 2013 and 2014 are not yet complete, but at least one conference will be held in the UK in 2013 and one in Japan in 2014.

Do you have a better suggestion of a name for this committee and liaison position? The committee’s mission is to work with non-North American members and conferences to increase IEEE NPSS support and to encourage activities in these region (IEEE Regions 8–10). If you have a good thought, send it to me.

**LIAISON REPORTS**

Community Solutions Initiative liaison Ray Larsen, who is also cochair of the Community Solutions group housed in

the Power and Energy Society, notes that the SunBlazer project in Haiti has had amazing success and that there are 2,000 clients on the waiting list for home lighting. Final assembly of SunBlazer units in being done in Haiti and there are plans to do trailer construction and all assembly there under a new Haitian corporation. The goal of CSI is to plant this and other appropriate technologies around the world to meet some of the need of the 1.4 billion people who have no electricity while starting businesses and creating jobs. In Haiti there is support from USAID and the UN Environments Programme has expressed interest, especially because solar power eliminates the toxicity of burning kerosene, now used for light in many places. A CSI workshop in Johannesburg, South Africa, at the IEEE PES Power Africa conference, is bringing together NGOs, educators and engineers to discuss future possibilities.

To support the work of CSI donate to the IEEE Foundation’s CSI Fund: [www.ieee.org/donate](http://www.ieee.org/donate) and specify CSI.

Sandra Biedron, the IEEE-USA R&D Policy Committee liaison, encouraged people to look at their web site. There is a lot of material including a position statement on ITER voicing the concern of the U.S. fusion community over cuts to the domestic program, a draft position statement on export control, and a letter from Norbert Holtkamp (SLAC) concerning the future of accelerators across a broad spectrum of applications.

ICALEPCS liaison, Peter Clout, noted that an MOU is needed for technical cosponsorship of the 2013 conference in San Francisco.

See the article on the Coalition for Plasma Science award at the Intel Science Fair. NPSS continues to support the work of CPS in educating the public on plasma sciences, and working with K-12 teachers and with Congress.

## SOCIETY GENERAL BUSINESS

### ADCOM ACTIONS TAKEN BETWEEN ADCOM MEETINGS:

- Approve shortening the Radiation Instrumentation election cycle from 60 to 45 days on a one-time basis. Passed by e-mail vote
- Approve motion from Radiation Instrumentation to fund up to \$25K to support attendees at Domestic Nuclear Defense Organization meeting. Passed by e-mail vote
- Motion to correct minutes of Valencia AdCom meeting: Amount voted to assist in CSI work in Haiti was \$50k rather than \$40k.

### ADCOM ACTIONS

- It was moved and passed that it be recommended to TABARC that the PSAC Outstanding Student Award be renamed the Igor Alexeff Outstanding Student Award
- Phelps Grants: To inform all the Technical Committee Chairmen and Conference Chairs, the NPSS Treasurer will follow these guidelines in the administration of the Phelps Grants. The candidates will be selected by conference chairman or his delegate.

- 1) The award is limited to \$750 for each recipient
  - 2) The number of awards per conference is limited to 3
  - 3) Support the cost of short course (tutorials) fee at an NPSS Conference
  - 4) Support the cost of travel and hotel to the NPSS Short Course
  - 5) Recommended reimbursement procedures include:
    - a. Expenses submitted on an IEEE expense report form, or
    - b. Paid directly from the conference budget to the provider
- NPSS AdCom requests that their author open access fee for the *Transactions on Nuclear Science* and *Transactions on Plasma Science* be set equal to that of the "New Style" Journal – IEEE Access.

*Albe Larsen, IEEE NPSS secretary and Newsletter editor can be reached at [amlarsen@slac.stanford.edu](mailto:amlarsen@slac.stanford.edu) or by phone at +1 650-926-2748.*

### I've got plenty of nothin'

*There is not enough time to do all the nothing we want to do.*

Bill Watterson

## TECHNICAL COMMITTEES

### Fusion Technology

The 25<sup>th</sup> Symposium on Fusion Technology will take place on June 10-14, 2013 at the Stanford Court hotel in San Francisco CA. Wayne Meier of LLNL is the general chair and Hutch Neilson of PPPL is the technical program chair. A mini-course on plasma surface interactions will be offered the day prior to the conference. SOFE 2013 will also host the Fusion Technology Committee awards banquet. A tour of the National Ignition Facility (NIF), the world's largest laser inertial fusion experiment, at

LLNL, is also planned. The conference web site is <http://sofe2013.org>. Please visit the website for schedule updates, paper submission, registration and accommodation details.

The 26<sup>th</sup> SOFE will be collocated with the Pulse Power Conference at the Hilton Austin hotel, Austin TX on May 31<sup>st</sup>–June 4<sup>th</sup>, 2015. JP Allain from Purdue University is the general chair.

*(continued on page 20)*



Dennis Youchison  
*Fusion Technology Technical Committee*

## TECHNICAL COMMITTEES

### I'll get back to you

*The test of a good teacher is not how many questions he can ask his pupils that they will answer readily, but how many questions he inspires them to ask him which he finds hard to answer.*

Alice Wellington Rollins

*(continued from page 19)*

Initial site visits and the hotel contract are now completed. We would like to thank Mark Crawford from the Pulse Power Science and Technology Committee for his gracious cooperation in choosing this venue.

The Fusion Technology (FT) award is an annual award that recognizes outstanding contributions to research and development in the field of Fusion Technology. The 2012 nominations closed on June 30<sup>th</sup>. The 2012 recipient will be announced in the December NPSS newsletter. Nominations for the 2013 award will open on January 2<sup>th</sup>, 2013 and close March 29, 2013. The 2013 nominations can be sent to Ms. Tiana Dodson, Fusion Technology Awards chair, at [tdodson@pppl.gov](mailto:tdodson@pppl.gov) starting in January. Both the 2012 and 2013 recipients will receive the awards at the SOFE2013 banquet. We will also present the best student paper award for the conference at that time. A list of past FT award recipients can be found at <http://ewh.ieee.org/soc/nps/tc-ftc-awards.html>.

Congratulations are in order for the recently elevated IEEE fellows who work in Fusion Technology. These include Mark Tillack from UCSD and Ahmed Hassanein from Purdue University.

As my tenure as chair of the Fusion Technology Committee draws to a close this year, I would like to thank all the past and present members of the Fusion Technology Standing Committee for their support. Special thanks go to Chas Neumeyer, Wayne Meier, and JP Allain who agreed to chair the SOFE conferences in 2011, 2013 and 2015, respectively, and Tiana Dodson for managing the awards process. The standing committee offers its many thanks to the attendees, committee members and the volunteers who have made SOFE a success for over 47 years.

*Dennis Youchison, Chair of the Fusion Technology Committee, can be reached at Sandia National Laboratories, Fusion Technology Department 01658, PO Box 5800, MS-1129, Albuquerque, NM 87185-1129; Phone: +1 5-5 845-31348; E-mail [dlyouch@sandia.gov](mailto:dlyouch@sandia.gov).*



Suleman Surti  
NMIS Technical Committee Chair

## Nuclear Medical and Imaging Sciences

**B**y the time you read this newsletter, the program for the 2012 IEEE NPSS Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) will be finalized. The General Chair for this meeting is Tom Lewellen, while Vesna Sossi and Alex Converse are the MIC Program Chair and Deputy Program Chair, respectively. The meeting which will take place at the Disneyland Hotel Convention Center in Anaheim, CA from Oct. 27<sup>th</sup>–Nov. 3<sup>rd</sup> had a total of 1834 abstracts submitted for the combined scientific sessions and specialized workshops, with 755 abstracts submitted as part of the MIC program.

The total number of submitted abstracts this year was a record high for an IEEE NSS/MIC meeting held in the U.S.. Joint sessions will take place on Tuesday, and the main MIC program will extend from Wednesday through Saturday.

A short courses program covering seven different topics of interest in nuclear science and medical imaging will take place from Saturday, Oct. 27<sup>th</sup> through Monday, Oct. 29<sup>th</sup>. In addition, four short refresher courses (one hour long each) will be offered in the mornings from Wednesday through Saturday before the main MIC scientific sessions.

## TECHNICAL COMMITTEES

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This year's topics will be: technology and applications of light detectors, ultrasound imaging, ROC analysis, and the development and validation of useful radiopharmaceuticals. In addition, a special workshop titled "New Technologies in Hadron Therapy: Particle Imaging and Optimization of Treatment Delivery" will take place on Sunday, Oct. 28<sup>th</sup>.

The 2013 IEEE NSS/MIC meeting will take place for the first time in Asia at the Coex Convention Center in Seoul, South Korea from Oct. 27<sup>th</sup> to Nov. 2<sup>nd</sup>. The conference center is located in the southern part of the city with good transportation access to downtown Seoul and the airport. Hee-Joung Kim is the General Chair for the meeting, while Jae Sung Lee and Craig Levin will be the MIC Program Chair and Deputy Program Chair, respectively. The organizing committee is actively working to plan a successful meeting, and an early conference website is online (<http://www.nss-mic.org/2013/NSSMain.asp>).

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. The location for the 2015 meeting has not been finalized, but the meeting will take place in the U.S. and a selection will be made very soon. Some of the sites under consideration are Boston, Knoxville, and San Diego. The 2016 IEEE NSS/MIC meeting will be held in Strasbourg, France.

In election news, we had a good slate of eight candidates this year running for one of the five seats open annually on the Nuclear Medical and Imaging Science Council (NMISC). The NMISC has oversight of the Medical Imaging Conference component of the annual IEEE NPSS NSS/MIC. This includes voting on site selection, approval of the MIC chair, and promotion of activities useful to all IEEE NPSS members who are interested in medical imaging. If you are interested in serving on the NMISC please contact George Kontaxakis, [g.kontaxakis@ieee.org](mailto:g.kontaxakis@ieee.org), NMISC Secretary and Chair of the Nominations Subcommittee.

*Suleman Surti can be reached at the 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](mailto:surti@mail.med.upenn.edu)*

### Wikipedia's fault

*We live in a world with more knowledge, but it is populated by people with less knowledge.*

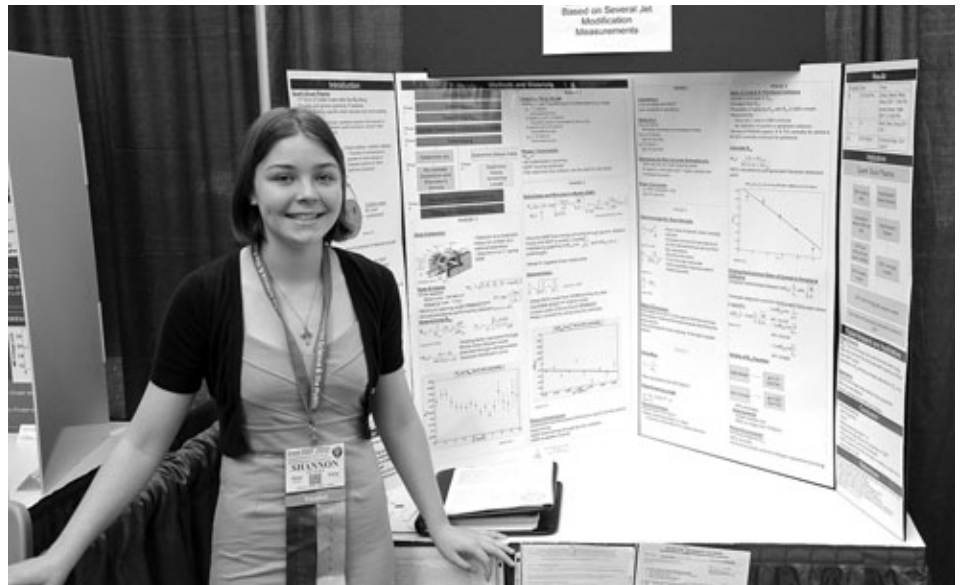
Gordon Campbell

## Exploring Plasma Projects at the Intel International Science and Engineering Fair

### And their hearing

*Pop music is about stealing pocket money from children.*

Ian Anderson



Shannon Wetzler with her award-winning Excellence in Plasma Physics poster.

For the eighth year in a row, the Coalition for Plasma Science presented its Excellence in Plasma Physics Award at the Intel International Science and Engineering Fair. From over 1500 precollege students competing, CPS Chair Lee Berry discovered 15 that explored the topic of plasma. The prize of \$1500 was given to Shannon Wetzler of Kings Park High School in Kings Park, NY for her project **The Novel Determination of the Stopping Power and Other Characteristics of Quark-Gluon Plasma Based on Several Jet Modification Measurements**.

Shannon Wetzler's project is based on data from Brookhaven National Laboratory, where their Relativistic Heavy Ion Collider (RHIC) accelerates trillions of "gold ions" in opposite

directions around a 2.4 mile circular track. Those ions that smash into each other and explode can generate enough heat to create a tiny amount of quark-gluon plasma for only a tiny fraction of a second. Understanding the behavior of this ephemeral matter can provide insights into the universe immediately after the Big Bang.

According to Lee, Shannon patiently explained how her analysis suggested that the quark-gluon plasma has characteristics of both a 'strongly coupled' plasma and of a 'weakly coupled' plasma. Her equally patient description of the difference between weakly and strongly coupled plasmas emphasized the stronger role of Debye shielding in weakly coupled systems.

### Gay blades are mowed down

*A lawn is nature under totalitarian rule.*

Michael Pollan

## LIAISON REPORT

Besides the CPS Special Award, Wetzler received an INTEL Grand Award – a so-called “Third Award” of \$1000 in the Physics and Astronomy category. Six other plasma projects were recognized with Special and/or Grand Awards.

**Unidirectionalization of Particulate Distributions in Isotropic D+D → He<sup>3+n</sup> Reactions Utilizing Differential Ion Velocities:** Benjamin Bartlett, Lexington High School, Lexington, SC.

Intel Physics and Astronomy Fourth Award (\$500); European Organization for Nuclear Research – CERN (awarded an all-expense trip to tour CERN).

**The Development of Low Voltage, Solid-State Plasma Focus Devices for Portable Radiation Sources:** Adam Bowman, Montgomery Bell Academy, Nashville, TN.

Intel Physics and Astronomy Fourth Award (\$500); Air Force Research Laboratory First Award (\$3000); Vacuum Technology Division of the American Vacuum Society Second Award (\$500); Office of Naval Research on behalf of U.S. Navy and Marine Corps Tuition Scholarship Award (\$8000).

**The Use of an Inertial Electrostatic Confinement Fusion Reactor in Medical Treatment and Imaging:** William Jack, Hudson High School, Hudson, OH.

International Council on Systems Engineering Second Award (\$500); Office of Naval Research on behalf of

the U.S. Navy and Marine Corps Tuition Scholarship Award (\$8000).

**Deuterium Fusion Using Inertial Electrostatic Confinement:** Michael Kovalchick, Dallastown Area High School, Dallastown, PA.

Intel Physics and Astronomy Fourth Award (\$500)

**Amateur Laser Physics: Engineering Affordable Gas Lasers to Discover What Affects Output Power:** Joseph Lee, Saint Peter's Academy, New Market, AL.

Intel Physics and Astronomy Fourth Award (\$500)

**The Removal of Harmful Contaminants in Water Using Low Temperature Microplasma:** Mervy Atif Michael, Union City High School / Academy for Enrichment and Advancement, Union City, NJ.

Intel Environmental Sciences Fourth Award (\$500); Air Force Research Laboratory on behalf of the U.S. Air Force First Award (\$3000)

“Each year, special award organizations recognize selected young scientists during the Intel International Science and Engineering Fair. We congratulate these winners. Participating in events such as this competition requires drive and curiosity that will lead these students in the quest for answers to significant scientific questions,” said Elizabeth Marincola, president of the Society for Science & the Public.

### And makes them rich, alas...

*You can't shame or humiliate modern celebrities. What used to be called shame and humiliation is now called publicity.*

P. J. O'Rourke

### And never come out?

*Our heads are round so that thoughts can change direction.*

Francis Picabia



Patrick Le Dù

## Society Awards

### 2012 RICHARD F. SHEA DISTINGUISHED MEMBER AWARD

#### Dr. Patrick Le Dù

Dr. Patrick Le Dù (M'97,S'11) was a senior experimental physicist at the French Atomic Energy Commission (CEA) from 1969 to 2007. He is now Senior Scientific Advisor for promoting multidisciplinary actions at IN2P3-CNRS Lyon (Institut de Physique Nucléaire) .

He received his Ph.D. in 1973 with his dissertation based on results of charge exchange with a polarized target at CERN-PS. As a Saclay group leader he was involved in many particle accelerator experiments at CERN (SPS-NA3, LEP-OPAL, LHC-ATLAS), SSC-SDC, Tevatron-DO and for the International Linear Collider studies (ILC).

He is expert in instrumentation for large experimental systems (wire chambers (MWPC), photodetectors (MCP and APDs), timing detectors (Time of Flight), electronics (Trigger and Data Acquisition). He has served as a scientific advisor for CEA and IN2P3 since 2002 with a focus on technology transfer between fundamental physics instrumentation and biomedical

imaging in particular for Positron Emission Tomography (PET) and for Particle Therapy.

He has been General Chairman of many multidisciplinary conferences and workshops; in particular are the IEEE NPSS 1997 Real-Time Conference (Beaune, France) and General Chair of the first non-North American IEEE NSS/MIC held in 2000 in Lyon. He served as Program Chair of several other IEEE NPSS Real-Time conferences (2003-Montreal, 2008-Beijing, 2009-Lisbon). He is now an appointed member of the Administrative Committee (AdCom) of the IEEE Nuclear and Plasma Physics Sciences Society (NPSS) as Transnational Conferences Liaison with the objective of promoting actively regular international conferences in Europe as well as in Asia and in assisting these conferences in managing the hurdles in working in diverse countries and cultures.

***Citation: In appreciation of 17 years of outstanding contributions to IEEE, NPSS, CANPS and his pioneer role in initiating NPSS conferences in Europe and Asia.***

*Patrick Le Dù can be reached by E-mail at [p.ledu@ipnl.in2p3.fr](mailto:p.ledu@ipnl.in2p3.fr).*

### Perpetual quandary

*The average man, who does not know what to do with life, wants another one which will last forever.*

Anatole France



## FUNCTIONAL COMMITTEES

### 2012 YOUNG INVESTIGATOR AWARD

#### Brent Jones

Brent Jones received a B.S. in Physics and the Dean's Medal in Science from the University of Washington in 1997, and a Ph.D. in Physics from Princeton University in 2002. His graduate thesis work at the Princeton Plasma Physics Laboratory focused on implementing a plasma wave emission temperature diagnostic for magnetically confined fusion plasmas. Dr. Jones has been with the Center for Pulsed Power Sciences at Sandia National Laboratories since 2002, where he has studied the physics of fast magnetic implosions.

Dr. Jones has served as principal investigator for over 50 shots on Sandia's 20 MA Z machine, as well as on other pulsed-power facilities. He has used Doppler X-ray spectroscopy to measure 700 km/s implosion velocities of these z-pinch plasmas, and developed a unique multicolor X-ray pinhole camera employing multilayer mirrors to produce stunning time-gated images of z-pinch implosions on Z and on the 8 MA Saturn pulsed-power driver. He is part of a multi-institutional team which in 2011 received a Department of Energy NNSA Defense Programs Award of Excellence for developing soft X-ray radiation sources on Z.

Dr. Jones' work includes a variety of novel experiments investigating fundamental

z-pinch dynamics and plasma physics. He pioneered the use of seeded perturbations in wire arrays to study the evolution of the magnetic Rayleigh-Taylor instability in these complex plasmas with Imperial College, and localized spectroscopic dopants to track plasma conditions and particle transport in joint experiments at the University of Nevada, Reno. Dr. Jones is the lead author on a 2010 *Physical Review Letter* featured on the journal cover which studied a new z-pinch-driven inertial confinement fusion configuration on Saturn, in collaboration with the University of Nevada, Reno, and the Ecole Polytechnique. Dr. Jones is an author of over 80 papers, including four *Physical Review Letters* as first author and several publications in *IEEE Transactions on Plasma Science*. He has frequently attended the IEEE ICOPS conference, and has served as session organizer in Z Pinches and Radiation Sources on several occasions.

***Citation: For contributions to understanding and developing z-pinch radiation sources on fast, high current pulsed power facilities, and for novel z-pinch physics studies.***

*Brent Jones can be reached at Sandia National Laboratories, P.O. 5800, MS1193, Albuquerque, NM 87185-1193; Phone: +1 505 284-9481; E-mail: [bmjones@sandia.gov](mailto:bmjones@sandia.gov).*



Brent Jones

### And investing?

*How to make a small fortune: You take a huge fortune and go racing.*

Raymond Parks (A NASCAR pioneer)

## FUNCTIONAL COMMITTEES



Lt. James E. Bevins  
2012 Graduate Scholar

### 2012 GRADUATE SCHOLAR AWARD

#### James E. Bevins

First Lieutenant James E. Bevins received the Master of Science degree in Nuclear Engineering from the Air Force Institute of Technology in 2011 with a thesis titled, "Characterization of a Boron Carbide Heterojunction Neutron Detector." He received his undergraduate degree from the University of Tennessee in Knoxville in 2009.

Lt. Bevins spent 3 years in the Alabama Army National Guard. During this time, he was an Honor Graduate from the

Explosive Ordnance Disposal School at Eglin Air Force Base and was deployed to Bosnia in support of Task Force Eagle. Lt. Bevins has been awarded the Army Commendation Medal, Army Achievement Medal, National Defense Service Medal, Armed Forces Expeditionary Medal and the Global War on Terrorism Service Medal. He is currently stationed at the Air Force Nuclear Weapons Center, Kirtland Air Force Base, New Mexico, where his duties involve modeling and simulation to support nuclear effects studies and assess survivability/vulnerability of Air Force systems.



Cher Xuan Zhang  
2012 Graduate Scholar

### 2012 GRADUATE SCHOLAR AWARD

#### Cher Xuan Zhang

Cher Xuan Zhang received the B.S. degree in electrical engineering from Huazhong University of Science and Technology, Wuhan, China, in 2008 and the M.S. degree in electrical engineering from Vanderbilt University, Nashville,

TN, in 2011, where she is presently working toward the Ph.D. degree in the School of Electrical Engineering and Computer Science.

Her current research interests include radiation effects and reliability of advanced materials and devices, including Ge pMOSFETs, SiC MOSFETs and carbon-based materials and devices.

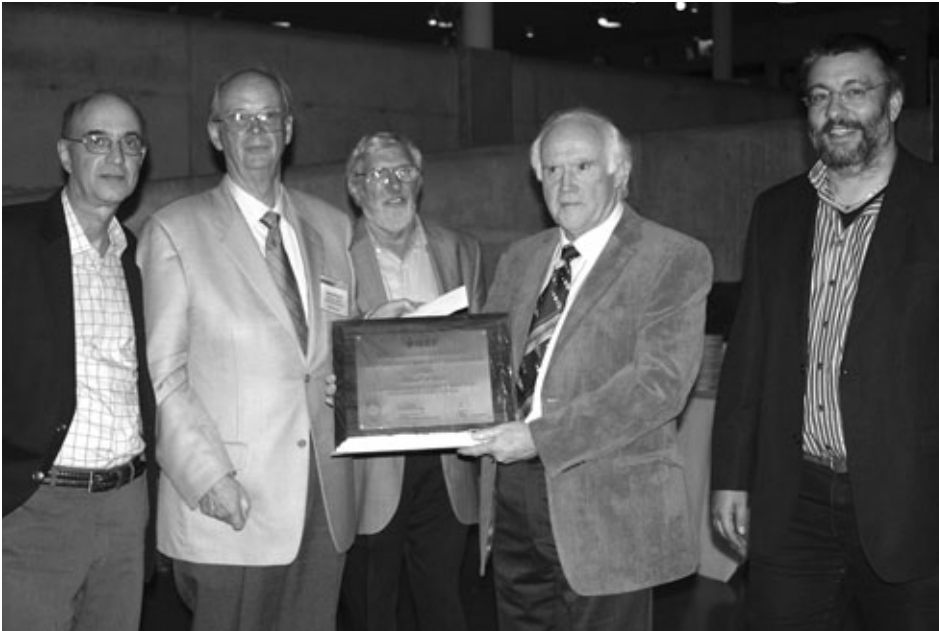
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## Technical Committee Awards



From left: Sergio Zimmermann, Jean-Pierre Martin, Patrick Le Dù, Chris Parkman holding award plaque, Stefan Ritt

### CANPS AWARD

#### Christopher Parkman

Christopher Parkman is now retired, but he was a senior engineer at CERN. Chris joined CERN in 1970 designing computer interfaces and read-out modules for PS experiments such as Omega and ISR-SFM. Then, in the 1980s, he became a Data Division section leader during the early days of microprocessors and LEPs. Promotion of modular electronics, standardization of what could be standardized, and support to users are what make engineers and physicists think of Chris and many of us have witnessed his work in the field over the years since we first met him in the beginning of the 1990s.

At that time many CERN users were preparing the LEP experiments and those who are old enough might remember that in these days, mentioning

something other than FASTBUS appeared as some sort of heresy. At OPAL we wanted to have the data acquisition system in VME and we were desperately seeking for some support in the field. We got quite lot of support from Chris who was one of the few working with VME equipment. He managed to make VME crates adapted to our needs, to make us meet with companies able to help us and he also put a lot of energy, with others, into promoting the use of VME in high-energy physics experiments. As more and more people began using VME, Chris' activities in the field increased. He helped users in many different ways, one being the circulation of information with the view of fostering common developments and he organized several events including the first "VMEbus in

*(continued on page 28)*

### E.g. Airplanes vs. Bicycles

*The larger and more complex a machine, the more unforgiving it is when something goes wrong.*

Anonymous

### The view from the trenches

*The higher up the monkey climbs the more he shows his behind.*

Reginald Hill

## FUNCTIONAL COMMITTEES

### But not necessarily read

*Writing is a way of talking without being interrupted.*

Jules Renard

*(continued from page 27)*

Physics” conference at CERN, followed later by several other events of that type organized with VITA.

VME proved to be a good standard for modular electronics but was missing some features and Chris worked to make them available. For instance, he actively pushed for the standardization of the VME Interconnect Crate Bus (VICBus) allowing several crates to be connected, or later developed a special protocol that was very useful for our readout applications. To help users, he put in place several frame contracts with companies supplying VME equipment. That simplified the purchasing procedures for several experiments and in particular ALEPH when they moved from Fastbus to VME for their readout processors.

In the 1990s Chris joined the group hosting the CERN electronics pool that is probably one of the largest suppliers of modular electronics in the world. He was mandated to coordinate VME activities for all the experiments and one outcome of his activity was the definition of the VME for Physics Applications. He belonged to the ESONE executive committee.

At the very beginning of the 2000s, Chris joined the electronics group of the ATLAS experiment where, following his wish to promote standard solutions, he worked on the specification of a family of VME crates and of standard power supplies that could be used by several subdetectors. This work was finalized when he became the group leader for Electronic Systems Support at CERN

and he put in place frame contracts for the procurement of VME crates and low- and high-voltage power supplies. These contracts are still in place; the maintenance contracts are valid until 2019 and several hundreds of crates and thousands of power supplies are used in the LHC experiments and in the machine. With his group hosting the CERN electronics pool, Chris again did a lot to help people in getting the necessary modular electronics and in making new modern equipment available to the community.

This is a very short and very succinct summary of Chris’ activity in the field of modular electronics and of promoting the use of standard and common solutions whenever possible. At a time when resources are sparse, but while individualism is still the most common quality of people in our community, we realize how important the availability of common standard equipment such as modular electronics is, and how valuable people are who actively promote standardization. During his professional life, Chris was one of those. We are deeply indebted to him and we know he fully deserves the award he was presented at the 2012 Real-Time Conference.

***Citation: For outstanding development and user support of modular electronics for the instrumentation in physics applications.***

*Chris Parkman is retired and lives in France not far from the Swiss border and CERN. He can be reached by E-mail at [chris.parkman@free.fr](mailto:chris.parkman@free.fr).*

*Report submitted by Patrick Le Dû*

### So a blank page does it!

*Some people become so expert at reading between the lines they don't read the lines.*

Margaret Millar

## FUNCTIONAL COMMITTEES

### 2012 CANPS STUDENT PAPER AWARDS



Student Award Recipients with Dr. Michael LaVine, left, Larissa Njejmiana, Ana Fernandes, Diego Sanz and Stefan Ritt, CANPS chair.

**D**r. Michael LaVine of Brookhaven National Laboratory chaired the 2012 Real-Time Conference Student Paper Awards committee. This year the committee elected to give three awards: first and second place awards and an honorable mention. The first and second place award recipients received a certificate as well as a financial award while the honorable mention student received a certificate. This year the recipients were:

#### FIRST PLACE

Larissa Njejmiana, *Design of a real-time FPGA-based DAQ architecture for the LabPET II, an APD-based Scanner dedicated to small animal PET imaging*, Department of Electrical Engineering and Computer Engineering, Université de Sherbrooke, QC, Canada.

#### SECOND PLACE

Diego Sanz, *Implementation of Intelligent Data Acquisition Systems for Fusion Experiment Using EPICS and FlexRIO Technology*, Instrumentation and Applied Acoustic Research Group, CAEND CSIC-UPM. Universidad Politécnica de Madrid (UPM), Spain.

#### HONORABLE MENTION

Ana Fernandes, *Real-Time Processing System for the JET Hard X-Ray and Gamma-Ray Profile Monitor Enhancement*, Associação EURATOM/IST, Instituto de Plasmas e Fusão Nuclear, Instituto Superior Técnico, Universidade Técnica de Lisboa, 1049-001 Lisboa, Portugal.

Congratulations to these fine young people. We look forward to following their careers in our community.

#### Show off

*The caterpillar does all the work,  
but the butterfly gets the publicity.*

George Carlin

#### But fits our biases

*The senses do not deceive; it is the  
judgment that deceives.*

Goethe

## Radiation Effects Award Nominations Sought

### We all make mistakes

*I don't hate my enemies.  
After all I made 'em.*

Red Skelton

Nominations are due January 31<sup>st</sup>, 2013, for awards presented at the IEEE NSREC 2013 Conference July 8<sup>th</sup>-12<sup>th</sup>, 2013 in San Francisco.

### RADIATION EFFECTS AWARD NOMINATIONS

Nominations are currently being accepted for the 2013 IEEE Nuclear and Plasma Sciences Society (NPSS) Radiation Effects Award. The purpose of the award is to recognize individuals who have had a sustained history of outstanding and innovative technical and/or leadership contributions to the radiation effects community. The \$3,000 cash award and plaque will be presented at NSREC San Francisco. Nomination forms are available electronically at <http://www.nsrec.com/nominate.htm> and must be submitted by January 31<sup>st</sup>, 2013.

Additional information can be obtained from Vincent Pouget, Member-at-Large for the Radiation Effects Steering Group.

*Vincent can be reached at 33-5-4000-2859  
or at [Vincent.pouget@ims-bordeaux.fr](mailto:Vincent.pouget@ims-bordeaux.fr).*

### PAUL PHELPS STUDENT GRANT NOMINATIONS

Nominations are currently being accepted for the 2013 Paul Phelps Continuing Education Grant. The purpose of the grant is to promote continuing education (attendance at the 2013 NSREC Short Course) and encourage membership in NPSS. University professors may nominate outstanding student members of NPSS. Unemployed members of NPSS who need assistance in changing careers can also be nominated for the award. The cash award of up to \$750 will be distributed before the 2013 NSREC in San Francisco, so that the award recipient can apply the funds towards covering travel costs to the short course. The award includes complimentary short course registration.

Nomination forms are available electronically at <http://www.nsrec.com/steering.htm> and must be submitted by January 31<sup>st</sup>, 2013. Additional information can be obtained from Nick van Vonno, Member-at-Large for the Radiation Effects Steering Group.

*Nick can be reached at +1 321-961-0686  
or at [nvanvonno@intersil.com](mailto:nvanvonno@intersil.com).*

### Rather "willing to afford"

*I understand the value of science  
but there is a cash constraint on  
what we can afford.*

David Willets  
(U.K. Minister for Universities  
and Science)

## 2014 IEEE Marie Sklodowska-Curie Award Applications



The IEEE Marie Sklodowska-Curie Award Medal

IEEE Marie Sklodowska-Curie Award Applications are due no later than January 31<sup>st</sup>, 2013. I am soliciting nominations for this award to be selected next year with the results announced in June. This is an annual IEEE Technical Field Award (TFA) that recognizes outstanding contributions to the field of Nuclear and Plasma Sciences and Engineering. This covers a broad scope of activities, but the unifying themes are ionizing radiation and ionized gases, especially their behavior, measurement and effects. This is one of the highest awards in the IEEE hierarchy, and it can be presented to an individual or to individuals on a team or multiple recipients up to three in number. The award consists of a U.S. \$10,000 honorarium, a bronze medal(s), and a certificate(s).

In the evaluation process, the following criteria are considered:

- Importance of individual scientific contribution
- Importance of scientific contributions made by teams led by the candidate
- Seminal nature of the contribution
- Innovation/originality
- Societal benefit
- Impact on the profession
- Quality of the nomination.

The “Curie Award” is an IEEE award, i.e., an Institute-level award, and is not restricted to NPSS members. Nominations for all of these are due on or before January 31<sup>st</sup>, 2013. The award will be presented during the appropriate conference following the announcement of the award.

For more information and the nomination forms, please go to [www.ieee.org](http://www.ieee.org) and search on “Curie Award”—much easier than typing the full URL!

*Peter Clout, Chair of the Curie Award Committee, can be reached at:*

*Vista Control Systems, Inc., 2101 Trinity Sq., Suite Q, Los Alamos, NM 87544-4103  
Phone: +1 505-662-2484 Fax: +1 505-662-3956 E-mail: [clout@vista-control.com](mailto:clout@vista-control.com).*



Peter Clout  
*Communications Committee Chair*

### IEEE/NPSS AWARDS NOMINATIONS DUE JANUARY 31<sup>ST</sup>, 2013

Now is the time to nominate NPSS members for Society Awards: the **Merit, Shea, Early Achievement and Graduate Scholarship Awards** for 2013 will be announced in time for 2013 meetings. Nominate your deserving associates for these prestigious awards; See <http://ewh.ieee.org/soc/nps/awards.htm> for details and nomination forms.

*For further information contact Jane Lehr at [jmlehr@sandia.gov](mailto:jmlehr@sandia.gov).*



Mounir Laroussi

## Plasma Medicine: Emerging Applications of Low-temperature Plasmas for the Healthcare Arena

Plasma Medicine is a phrase that appeared around 2007-2008. It is a catchy and compact term (or rather two terms) that refers to the biomedical applications of low-temperature plasmas. The latter is a field of research that came to the forefront of plasma science in the late 1990s. After a successful investigation on the use of atmospheric pressure plasma to inactivate bacteria was published in an issue of the *IEEE Transactions on Plasma Science* in 1996 [1], research efforts accelerated rather rapidly into the late 1990s and early 2000s. By then low-temperature plasmas were being used to kill various pathogenic microorganisms, sterilize surfaces and liquids, induce necrosis and apoptosis in eukaryotic cells, etc. [1]-[7]. The pioneering groups in those early days were a group from the University of Montreal led by Prof. Michel Moisan, a group from Eindhoven University led Dr. Eva Stoffels, and my own group (University of Tennessee in the 1990s and then Old Dominion University from 1999 to the present). It is important to note that the emergence of plasma medicine corresponded with the development of various plasma sources that can generate stable low-temperature plasmas at atmospheric pressure. In the beginning stages, the Dielectric Barrier Discharge was largely used, then starting in the mid- 2000s, the development of plasma jets gave a great impetus to the field [8]-[10] (see Figure 1).

The first oral session that incorporated papers on the biological applications of plasmas was held at the 1998 IEEE International Conference on Plasma Science (ICOPS 1998). I had the pleasure to chair that session, which

had only three presentations on the topic. However, starting in the early 2000s, the ICOPS topic that included the biomedical applications of plasmas became one of the major attractions of the conference with between 60 and 100 contributions each year. This was not only typical for ICOPS but other international conferences experienced the same increase in submissions. In addition to conference sessions, the biomedical applications of plasmas became the topic of special issues of some prominent plasma journals. These included the *IEEE Transactions on Plasma Science*, IOP's *Journal of Physics D: Applied Physics*, and Wiley-VCH's *Plasma Sources and Polymers*. With the field gaining steady momentum, the International Conference on Plasma Medicine was established in 2007. This conference is dedicated entirely to the topic of plasma medicine and biology and this year (2012) will hold its fourth meeting.

Now that I have introduced a little bit of the history of the emerging, multidisciplinary, and transformational field of plasma medicine, let me give the reader a summary of low-temperature plasma potential in medical applications.

At biologically tolerable temperatures, low-temperature plasmas (or cold plasmas) can produce chemical species including reactive oxygen species (ROS) such as O, O<sub>2</sub><sup>-</sup>, and OH and reactive nitrogen species (RNS) such as NO and NO<sub>2</sub> which exhibit strong oxidative properties and/or trigger signaling pathways in biological cells. For example, oxidation of the lipids and proteins that constitute the membrane of biological cells leads to the loss of their functions.

### No friend of mine

*Do you know what a pessimist is?  
A man who thinks everybody  
is as nasty as himself, and hates  
them for it.*

George Bernard Shaw



In such environment bacterial cells were found to die in minutes or even seconds, depending on the strain [11]. Plasmas were also found to be an effective method to control the proliferation of biofilms [12]. Because cells in a biofilm closely interact with each other within the protective environment of a polysaccharide extracellular matrix, they exhibit different characteristics than free-floating planktonic cells. Biofilms are very resistant to chemicals found in detergents and even to antibiotics. Therefore, if not controlled, biofilms (including dental plaque, for example) could represent serious health hazards.

Under some conditions, low-temperature plasmas appear to cause little damage to living animal and plant tissues. Having different structures and morphologies, bacterial and mammalian cells exhibit different responses to physical and chemical stresses. For example, skin fibroblast cells are found to remain viable under plasma conditions that can be lethal to bacterial cells. However, plasmas can induce necrosis or apoptosis (programmed cell death), depending on the applied dose. At low doses plasmas were found to initiate apoptosis in cancerous cells, opening the possibility to use plasma technology as a therapy for some types of cancers (see Figure 2).

The proliferation of fibroblasts is an important step in the wound-healing process. The ability of plasma to kill bacteria and to accelerate the proliferation of specific tissue cells opened up the possibility to use plasma for the healing of wounds [13, 14] including chronic wounds such as diabetic ulcers. Tens of thousands of amputations occur every year in the U.S. alone because of the inability of present medical methods to heal chronic wounds.

The above applications ushered in a transformational approach to healthcare referred to as Plasma Medicine. Other medical uses of low-temperature

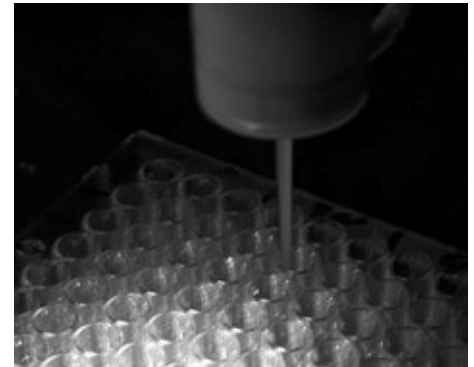
plasmas under investigation include dental applications, blood coagulation without damage to healthy tissue, and the treatment of surfaces to allow for the growth and proliferation of biological cells (tissue engineering). Recently (May 2012) the first book entirely dedicated to plasma medicine was published by Cambridge University Press. The chapters of this book were written by an international team of plasma physicists, microbiologists, biochemists, and medical doctors. The book title is *Plasma Medicine: Applications of Low Temperature Gas Plasmas in Medicine and Biology*. The editors are M. Laroussi, M. Kong, G. Morfill and W. Stolz.

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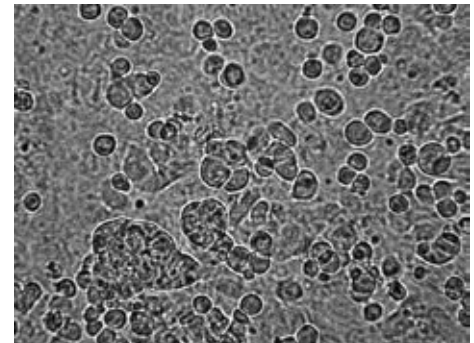
(continued on page 34)

Figure 1

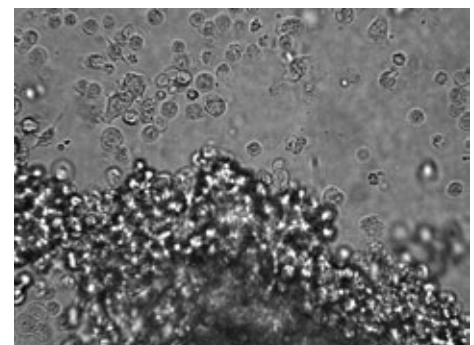


A low temperature plasma jet (Plasma Pencil) is being used to interact with biological cells in multiwell culture plate [8].

Figure 2



Photograph of control metastatic prostate cancer cells DU 145



Plasma treated (10 minutes) DU 145 cells showing clumps of dead cancer cells 24 hours after plasma exposure.

Photos courtesy of N. Barekzi & M. Laroussi, ODU's Applied Plasma Technology Lab.

## The origin of prejudice

*It is useless to try to reason a man  
out of a thing that he was never  
reasoned into.*

Jonathan Swift

(continued from page 33)

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Sandra Biedron  
Liaison to IEEE-USA's Research and  
Development Committee

## NPSS Members Serve on a DOE Fact-Finding Committee for Particle Accelerator Science and Technology

IEEE Nuclear Plasma Sciences Society (NPSS) Particle Accelerator Science and Technology (PAST) members are three of the 15 scientists and engineers handpicked to help collect facts for a U.S. Department of Energy (DOE) report to Congress about the future of accelerator science and technology for everything from security and medical equipment to cleaner water and air.

The recent senate appropriations language requested the Department of Energy to submit a ten-year strategic plan. The language is replicated here:

"The Committee understands that powerful new accelerator technologies created for basic science and developed by industry will produce particle accelerators with the potential to

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address key economic and societal issues confronting our Nation. However, the Committee is concerned with the divide that exists in translating breakthroughs in accelerator science and technology into applications that benefit the marketplace and American competitiveness. The Committee directs the Department to submit a 10-year strategic plan by June 1<sup>st</sup>, 2012 for accelerator technology research and development to advance accelerator applications in energy and the environment, medicine, industry, national security, and discovery science. The strategic plan should be based on the results of the Department's 2010 workshop study, Accelerators for America's Future, that identified the opportunities and research challenges for next-generation accelerators and how to improve coordination between basic and applied accelerator research. The strategic plan should also identify the potential need for demonstration and development facilities to help bridge the gap between development and deployment."

Based on this language, the Department of Energy's Associate Director of the Office of High Energy Physics, Jim Siegrist, in order to seek input from the community, asked SLAC Deputy Director Norbert Holtkamp to assemble and lead a fact-finding task force.

Sandra Biedron (Colorado State University), Stephen Gourlay (Lawrence Berkeley National Laboratory), Stephen Milton (Colorado State University) and the other committee members (listed below) were recruited by Holtkamp to serve on this committee. Holtkamp reinforced to the members that the 2010 DOE "Accelerators for America's Future" (available at <http://www.acceleratorsamerica.org/>) should be the base for this fact-finding mission.

### **Sandra Biedron**

Colorado State University

### **Lester Boeh**

Varian Medical Systems, Inc.

### **George Zdasiuk**

Varian Medical Systems, Inc.

### **Jim Clayton**

Varian Medical Systems, Inc.

### **Stephen Gourlay**

LBNL

### **Robert Hamm**

R&M Tech. Enterprises, Inc.

### **Stuart Henderson**

FNAL

### **Georg Hoffstaedter**

Cornell University

### **Norbert Holtkamp,**

CHAIR SLAC

### **Lia Merminga**

TRIUMF

### **Stephen Milton**

Colorado State University

### **Satoshi Ozaki**

BNL

### **Fulvia Pilat**

Jlab

### **Marion White**

ANL

### **Michael Zisman**

DOE-HEP

This team was responsible with reaching out to other scientists and engineers in their fields, the users of particle accelerators, program managers in other services and federal agencies, and industry to learn about accelerator technology and advancements that could be made in the next ten years.

Biedron previously served as Security and Defense Working Group cochair for a DOE report titled "Accelerators for

*(continued on page 36)*

## And scarcer!

*Comments are free but facts are sacred.*

C. P. Scott

## Family planning

*When I date a guy, I think, "Is this the man I want my children to spend their weekends with?"*

Rita Rudner

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### And still ravenous

*Modern English is the Wal-Mart of languages: convenient, huge, hard to avoid, superficially friendly, and devouring all rivals in its eagerness to expand.*

Mark Abley

### Reaction is the action

*Experience is not what happens to a man; it is what a man does with what happens to him.*

Aldous Huxely

*(continued from page 35)*

America's Future" submitted to Congress in 2010.

"Accelerators already help solve national challenges in industry, medicine, discovery science, energy and the environment and defense and security," Biedron said. "However, there is significant margin for improvement, especially in reference to better, more compact, and more efficient accelerators."

"The Department of Energy is also trying to motivate technology transfer," Biedron said. "You see a lot of work done in discovery science, but questions remain about how to transfer it so that it gets into medicine, industry, the environment and defense."

According to the 2010 DOE report, tens of thousands of accelerators are in use every day producing particle beams in medical facilities, manufacturing plants, industrial laboratories, printing plants and on ships.

In thinking about the future of accelerators, Biedron and Milton ask their colleagues to dream big and consider reaching across federal agencies to find solutions.

"It goes back to a statement once made by Henry Ford—'If I ask the customers what they wanted, they would have told me they wanted a faster horse,'" Milton said. "We want to know from scientists the problems they're facing and what technologies are appropriate to bridge that gap."

OHEP has unofficially played a stewardship role for many years, providing accelerator technology with significant societal benefit. Making stewardship an explicit programmatic direction is an incredible opportunity for HEP to have even greater impact.

A blog was established to help the committee members collect information

from the community connected with particle accelerators and their uses: [https://slacportal.slac.stanford.edu/sites/ad\\_public/committees/Acc\\_RandD\\_TF\\_Blog/default.aspx](https://slacportal.slac.stanford.edu/sites/ad_public/committees/Acc_RandD_TF_Blog/default.aspx).

Biedron (Senior Member IEEE) and Milton (Member IEEE and 2003 PAST Accelerator Technology prize recipient) joined Colorado State from Argonne National Laboratory and Sincrotrone Trieste, Italy, where they developed accelerators and peripherals for basic research as well as security and defense. They complement ongoing laser, light source, high-energy physics, radiation physics and plasma/propulsion activities at CSU. Before joining CSU, Biedron most recently served as the DOD Project Office director and as associate director of the Accelerator Institute at Argonne. In January, she was named a 2012 Fellow of SPIE—the international society for optics and photonics. Milton was a key member of the delivery team of the two brightest X-ray sources in North America. At Argonne most recently, he was Argonne Project Office director for the Argonne components for the Linac Coherent Light Source now operational at the SLAC National Accelerator Laboratory in California. Most recently he served as the project director at FERMI@Elettra, the free-electron-laser user facility in Trieste, Italy.

Stephen Gourlay (Senior Member IEEE) is Director of the Accelerator and Fusion Research Division (AFRD), Lawrence Berkeley National Laboratory, AFRD is a broad-based accelerator R&D organization comprised of five programs to generate and develop new concepts in accelerator technology. These include; theory and modeling, diagnostics and instrumentation, particle sources, laser plasma acceleration, high field superconducting magnets, beams of heavy ions and electron storage rings. Gourlay began his career at Fermilab as a particle physicist then moved into

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the field of accelerator magnet R&D, first at Fermilab, then LBNL, where he led the superconducting magnet R&D program that produced two record-setting dipoles and generated new applications. The program is now firmly established as the world leader in high-field-accelerator magnet development. Community activities include: member of the USPAS Board of Directors, PAC Organizing Committee, member of the Board and program chair for the Applied Superconductivity Conference (ASC) in 2006 and Conference Chair for 2012, and NA-PAC13 Conference Chair. He is a Fellow of the American Physical Society.

The documentation from the fact-finding mission has been delivered to the DOE and the task force is standing by to provide additional support as

required. A number of R&D areas have been identified for the accelerator community to address, supported by a communication loop that includes all stakeholders and customers, and keeping an eye on future needs. The national laboratories have the potential of creating new businesses and jobs that will strengthen our economy.

In the link below you can find both reports: <http://www.acceleratorsamerica.org/report/index.html>

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## 50 Nations Outline Shared Principles for Merit-Review of Research

### PROPOSALS

From *Today's Engineer*, July 12, 2012  
By IEEE-USA Staff

**O**n 14-15 May 2012, the National Science Foundation hosted a global summit of primary science-funding agencies from nearly 50 countries for the purpose of developing best practices for international collaboration and to outline a set of shared principles for merit-review of research proposals.

Participants were primarily from countries who are members of the Group of Twenty Finance Ministers and Central Bank Governors (G20) and/or the Organization for Economic Cooperation and Development (OECD).

In a 14 May blog post, John Holdren, assistant to the President for science and

technology and director of the White House Office of Science and Technology Policy, and Subra Suresh, Director of the National Science Foundation, underscored the importance of the summit, noting that “international collaboration poses unique challenges. Among the most important is the uneven commitment among nations to the highest standards of ‘merit review’—the gold-standard practice by which research proposals are judged by researchers’ peers to determine in a fair and evidence-based manner whether those proposals are worthy.”

They added, “without merit review, science funding is ever at risk of falling prey to social biases or political agendas.

*(continued on page 38)*

### Right on!

*The root of all superstition is that men observe when a thing hits, but not when it misses.*

Francis Bacon

### But give politicians a sense of accomplishment

*Useless laws weaken the necessary laws.*

Charles de Montesquieu

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### Blunt talk

*Though familiarity may not breed contempt, it takes the edge off admiration.*

William Hazlitt

*(continued from page 37)*

Experts simply can't be beat when it comes to assessing the likelihood that a proposed experiment will deliver the intellectual and material goods it promises."

The impetus for the summit was an international meeting held in October 2010 between the European Science Foundation and the heads of the European Research Councils to discuss plans for enhanced international research cooperation.

The National Science Foundation was invited by the European research heads to host an inter-governmental meeting on the topic of merit review. NSF subsequently formed an International Steering Committee (ISC) that was tasked with obtaining broad international input on a statement of principles. The ISC was comprised of representatives from research funding agencies from around the world, and held meetings in Brazil, South Africa, India, Saudi Arabia and Belgium to solicit regional input.

The result was a draft Statement of Principles on Scientific Merit Review, which was presented to the Summit for

adoption, and which is appended below. Participating governments hope that the general principles will provide a framework for discussion and planning to ensure greater consistency amongst national approaches to merit review, which will in turn facilitate international cooperation in government-funded research and development.

### FOR ADDITIONAL READING:

Statement of Principles for Scientific Merit Review, Global Summit on Merit Review (May 2012). Available online at: [http://www.nsf.gov/news/newsmedia/globalsummit/g\\_s\\_principles.pdf](http://www.nsf.gov/news/newsmedia/globalsummit/g_s_principles.pdf)

Merit Review: Ensuring Gold-Standard Science Around the Globe, by John P. Holdren and Subra Suresh, Office of Science and Technology Policy Blogsite (14 May 2012). Available online at: <http://www.whitehouse.gov/blog/2012/05/14/merit-review-ensuring-gold-standard-science-around-globe>

Report to the National Science Board on the National Science Foundation's Merit Review Process, Fiscal Year 2011 (NSB-12-28). Available online at: <http://www.nsf.gov/nsb/publications/2012/nsb1228.pdf>

### I'm still learning

*A woman need only know one man well to understand all men, whereas a man may know all women and not understand one of them.*

Helen Rowland

## Dillon H. McDaniel 1945-2012



Dillon H. McDaniel

**D**illon H. McDaniel will be remembered as a loving husband and father with a kind heart and adventurous spirit. He was regarded by his colleagues as a rare gentleman scientist: always generous, interested and gracious. He died unexpectedly at his home in Placitas, New Mexico on May 1<sup>st</sup>, 2012.

Dillon H. McDaniel was born in Austin, Texas in 1945, and received his B.S. and Ph.D. degrees in physics from the University of Texas in 1967 and 1973 respectively. At UT, he met Stephanie Hillaker and they were married on June 4<sup>th</sup>, 1966. Dillon and Stephanie were the proud parents of eight children. Stephanie passed away after an extended illness in 2007. Dillon and Susan Mertes married in 2010. Susan, his children, their spouses and his sixteen grandchildren will greatly miss Dillon.

Dr. Dillon McDaniel worked in the Sandia National Laboratories (SNL) Pulsed Power group for 38 years. He had broad ranging, in-depth understanding of pulsed power. His ability to build

collaborations was recognized as a special attribute. He demonstrated vision and perseverance required to get new ideas accepted and implemented. He was an excellent mentor to a large number of Sandia staff members and to many others in the international pulsed power community. He was an advisor to many organizations. In 2001 Dr. McDaniel was presented the IEEE Peter Haas Award by the by the Pulsed Power Science and Technology Committee for leadership and technical contributions to pulsed power technology in developing research programs and domestic and international collaborations with national laboratories, various institutes and universities.

When Dillon joined the Sandia Pulsed Power group, opportunities existed to perform R&D on all aspects of high power accelerators. Dillon worked on a broad range of these activities and developed an excellent knowledge of the underlining physics and engineering of these accelerators. His work during this time included Marx generator design, studies of the physics of liquid and gas breakdown, studies of vacuum interface flashover, investigation of the role of high magnetic fields in propagation of electromagnetic waves past vacuum insulation interfaces and down vacuum power flow channels and studies of physics of electron beam diodes.

In 1977 Dillon began research on fast z-pinches at the several mega-ampere level with implosion time of 60 ns using the Proto II accelerator. This research was inspired and supported by work at Air Force Weapons Laboratory and Los Alamos National Laboratories. In 1980 Dillon was promoted to Division Supervisor for Z-pinch and X-ray diagnostics. In subsequent years Dillon

*(continued on page 40)*

### Catch 22

*Of course I believe in free will—  
I have no other choice.*

Isaac Bashevis Singer

### ...to pick up the pieces

*War doesn't determine who is right  
—only who is left.*

Bertrand Russell

*(continued from page 39)*

managed the Division for Pulsed Power Research. He exercised a leadership role in the research for and construction of the following large accelerators at SNL: PBFA I, PBFA II, Saturn, Z and the Z Refurbishment.

During the 1980s Dillon coordinated a z-pinch campaign at the Trinity Institute in Troitsk, Russia with team members from LANL and LLNL in order to confirm Trinity's results on nested implosion. Subsequently, SNL collaborated with the Defense Threat Reduction Agency (DTRA), on multi-

shell gas puff z-pinch research at the High Current Electronics Institute (HCEI) in Tomsk, Russia. These works heightened interest in z-pinches and resulted in dedicated experimental campaigns at SNL fielded on the Saturn, a 10 MA driver and subsequently on the Z-machine at greater than 20 MA. In 1997, Dillon became the Deputy Director for Pulsed Power Technologies and External Alliances.

The collaboration among SNL, DTRA and Institutes in Russia was extended to include the French Direction générale de l'armement (DGA) laboratory, Centre d'Etudes de Gramat (CEG). Dillon

was the key person at SNL for these interactions and for obtaining an R&D agreement between the U.S. Department of Energy and the DGA in 2000. These collaborations proved to be very effective in the development and funding of pulsed power research in the Russian laboratories.

Dillon will be greatly missed by pulsed power scientists and engineers in many countries. Dillon retired from SNL in December 2011. He and his wife Susan had plans for an exciting and interesting retirement that unfortunately did not come to fruition.

*Prepared by Ken Prestwich.*