

NUCLEAR & PLASMA SCIENCES SOCIETY NEWS

A Publication of the Institute of Electrical and Electronics Engineers Number 1, March 2010

CONFERENCES

17th Real Time Conference RT-2010 23–28 May 2010, Lisbon, Portugal



16th Real Time Conference Plenary Session, Beijing, 2009

The upcoming 17th IEEE Real Time Conference (RT-2010) will be held from 23 to 28 May 2010, in Lisbon, Portugal, at the Congress Centre of the “Instituto Superior Técnico,” the largest Portuguese engineering school (www.ist.utl.pt). RT-2010 is being organized by the “Instituto de Plasmas e Fusão Nuclear” (IPFN) (www.ipfn.ist.utl.pt) and the “Laboratório de Instrumentação e Física Experimental de Partículas” (LIP) (www.lip.pt), two Associated Laboratories of the “Fundação para a Ciência e Tecnologia,” the funding research agency of the Portuguese Ministry of Science, Technology and Higher Education.

The General Chair of the conference is Professor Carlos Varandas from IPFN.

As with previous Real Time conferences, RT-2010 will be a multidisciplinary conference devoted to the latest developments in real time techniques in the fields of particle physics, plasma and nuclear fusion, nuclear physics and astrophysics, space science, accelerators, medical physics and other radiation instrumentation.

The conference philosophy is to have only plenary sessions to nurture the exchange of ideas and problems and cross-fertilization between researchers from

various fields. Mini-oral papers describing posters will be arranged as in the past. All this taken together lays the groundwork for an extremely stimulating environment, ample opportunity for discussions and fruitful exchanges particularly for young scientists and engineers.

The list of conference topics includes:

- Ultra-Fast Analog and Timing Converters and Digitizers
- Front-end Signal Processing
- Reconfigurable Hardware
- Real-Time System Architectures
- Trigger and Data Acquisition
- High-Level Triggers
- Event Building and Fast Networks
- High-Speed Synchronous Control
- Online Processing Farms
- Online Databases
- Control and Monitoring Systems
- Emerging Real-Time Technologies
- New standards (ATCA)

The target audience consists primarily of experts from the fields of Particle Physics, Nuclear Physics and Astrophysics, Nuclear Fusion, Accelerators, Medical Physics, Space and General Radiation Instrumentation.

In addition to the main event, we intend to organize some dedicated events such

(continued on page 3)

TABLE OF CONTENTS

CONFERENCES

| | |
|---------------------------|---|
| 17th Real Time Conference | 1 |
| 2010 NSREC | 3 |
| 2010 NSS/MIC | 5 |
| WIE 2009 Report | 7 |

GENERAL BUSINESS

| | |
|--------------------------------|----|
| President's Report | 9 |
| Secretary's Report | 11 |
| New AdCom Members | 14 |
| New Technical Committee Chairs | 17 |

TECHNICAL COMMITTEE REPORTS

| | |
|-----------------------------|----|
| Computer Applications | 20 |
| Nuclear and Medical Imaging | 21 |
| Pulsed Power ST | 24 |
| Radiation Effects | 26 |

FUNCTIONAL COMMITTEES

| | |
|---------------------------------|----|
| Awards | 27 |
| New Fellows | 27 |
| Healthcare Technology Medalists | 38 |
| Chapters | 40 |
| Kharkov Chapter | 40 |

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Sandra Biedron (IEEE-USA R&D)
Tony Laviets (Sensors Council)
Michael Unterweger, Ron Keyser (IEEE Standards Board)
Ron Jaszczak, Randy Brill (TMI liaisons)
Allan Johnston (Women in Engineering)

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Publicity releases for forthcoming meetings, items of interest from local chapters, committee reports, announcements, awards, or other materials requiring society publicity or relevant to NPSS should be submitted to the Newsletter Editor by April 8, 2010 for publication in the June 2010 Newsletter.

CONTRIBUTED ARTICLES

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

(continued from page 1)

as real-time exhibits, refresher courses, tutorials and topical workshops on hot subjects such as ATCA. One short course will cover the exciting field of digital pulse shape processing inside front-end electronics, which will be accompanied by industrial demonstrations.

A workshop on the Advanced Telecommunications Computing Architecture (ATCA) will continue to explore the merits of ATCA for use by the real-time science community. Particularly exciting will be the possibility to learn further about the recent progress achieved by the PICMG Technical Subcommittee, the xTCA for the Physics Coordinating Committee, in its work to develop ATCA standards for the physics community. The goal is to provide information that will assist attendees in making design decisions about utilizing ATCA hardware and associated software to achieve high availability in future large projects such as ITER.

Similar to the 2009 conference, RT-2010 will continue the tradition of presenting Outstanding Student Awards. This honors the best student submission accepted for oral presentation and the best student submission accepted for a poster presentation. The award is based on the quality of the work as described in the

paper submitted and will certainly foster the participation of young researchers.

Social events have been planned to give the attendees the opportunity for informal discussions. Besides a reception and the conference dinner there will be an excursion to Mafra, Ericeira and Sintra, a very beautiful area in the surroundings of Lisbon, visiting the Convent of Mafra as well as the castle and the palace in Sintra.

The conference center at Instituto Superior Técnico is located in the central area of Lisbon with widely available bus and underground line services, is within walking distance (5–10 minutes) from main city hotels and is only 3 km from the international airport. The wonderful city of Lisbon will certainly provide an outstanding environment for fruitful discussions, real-time exchange of experiences and foster the knowledge transfer among different communities.

Further details about the conference are available on the conference web site at <http://rt2010.ipfn.ist.utl.pt>.

Professor Carlos Varandas, chair of RT-2010 can be reached at Instituto de Plasmas e Fusão Nuclear, Av. Rovisco Pais, 1049-001 Lisbon, Portugal, Phone: +351 21 841 7696; E-mail: cvarandas@fn.ist.utl.pt; Bruno Soares-Gonçalves can be reached at bruno@icfn.ist.utl.pt.

2010 IEEE NSREC is Finalizing Plans for Denver, Colorado July 19–23, 2010

The 2010 IEEE Nuclear and Space Radiation Effects Conference will be held July 19–23, 2010, at the Sheraton Downtown Denver Hotel, Denver, Colorado. 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 19, a Radiation Effects Data Workshop, and an Industrial Exhibit.

The Sheraton Downtown Denver Hotel offers rooms with beautiful mountain and downtown views and is conveniently located on the 16th Street Pedestrian Mall. The 16th Street Mall

(continued on page 4)

Catch 22

Have you ever tried to convey anything about anything when you are constrained from acknowledging that there is anything to convey anything about?

Jim Hart (on an NDA)



Teresa Farris
Vice-Chairperson of Publicity



Fine distinction

The honourable member did not want the truth; the honourable member had asked for the facts.

Joseph Chamberlain
19th century British statesman

CONFERENCES

(continued from page 3)

is Denver's hub of shopping, dining and entertainment that stretches for 16 blocks in the heart of downtown. A free shuttle service is available right outside of the hotel to transport conference attendees to more than a mile of Denver's best restaurants and shops. The conference hotel is within walking distance of the Denver Art Museum, the United States Mint, and just minutes from Coors Field and historic LoDo (Lower Downtown Denver). The Sheraton Downtown Denver Hotel has just completed a \$70 million renovation, making it one of Denver's top conference hotels.

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 Colorado Springs, Boeing, BAE Systems, Honeywell, Intersil, Southwest Research Institute and Northrop Grumman.

TECHNICAL PROGRAM

Chaired by Jeff Black, Vanderbilt ISDE. 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, and scientists and managers who are concerned with radiation effects. International participation in the conference is strongly encouraged. Poster and Data Workshop chairs will be Veronique Ferlot-Cravois, ESA, and Leif Schieck, JPL.

TECHNICAL SESSION CHAIRS

Basic Mechanisms of Radiation Effects
Alessandro Paccagnella
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Ewart Blackmore
TRIUMF

Hardening by Design

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Boeing

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Sylvain Girard
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Radiation Effects in Devices and Integrated Circuits

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Single-Event Effects: Devices and Integrated Circuits

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Single-Event Effects: Mechanisms and Modeling

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Single-Event Effects: Transient Characterization

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Space and Terrestrial Environments

Justin Likar
Lockheed Martin

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.

CONFERENCES

PAPER SUBMITTAL

Information on the submission of summaries to the 2010 NSREC for either the Technical Sessions or the Data Workshop can be found at www.nsrec.com. The deadline for submitting summaries was February 5, 2010. A limited number of late news papers are typically accepted, with June 4th as the deadline for late news submission.

SHORT COURSE

Attendees will have the opportunity to participate in a one-day Short Course on Monday, July 19. The theme for the 2010 short course is: "Custom Integrated Circuits and Memories: Basic Mechanisms, Design and Qualification" and is being organized by Ron Lacoë, Aerospace Corporation. 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 Kirby Kruckmeyer, National Semiconductor. The exhibit will be held on Tuesday and Wednesday. It will include exhibits from 35-40 representative 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.

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Self-appreciation

The way I make a speech people know I'm not out to impress them, so I must be telling the truth.

Robert Stanfield

Late, non-charismatic Canadian politician

Nuclear Science Symposium, Medical Imaging Conference

The 2010 Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) will be held at the Knoxville Convention Center in Knoxville (KCC), Tennessee. In addition, the 17th Room Temperature Semiconductor Detector Conference will be held in conjunction with the NSS/MIC. The KCC is a modern, spacious meeting place in

downtown Knoxville and within walking distance of the conference hotels.

It will be my pleasure to welcome you to the meeting in October. The whole Committee has been organizing the conference over the past year to create an outstanding program of papers, short

(continued on page 6)



Ron Keyser
General Chair

CONFERENCES

(continued from page 5)

courses, workshops, and social events. Scientists and engineers in the fields of nuclear science and medical imaging are encouraged to participate and present their original work in a variety of subject areas related to these fields. This includes analog and digital circuits, astrophysics and space instrumentation, acquisition and analysis systems, environmental health and safety instrumentation, radiation detectors (alternatives to ^3He detectors, scintillation, semiconductor), high energy and nuclear physics instrumentation, nuclear measurements and monitoring techniques, nuclear power systems, radiation damage effects, synchrotron and neutron instrumentation, emission tomography instrumentation and techniques (PET and SPECT), nuclear medicine and multimodality imaging geometries and systems, analytical and Monte Carlo modeling of medical imaging systems, applications of new detector materials and technologies to medical imaging, multidimensional image reconstruction methods, data processing and quantitative image processing methods, evaluations of image systems and reconstruction methods, intraoperative probes and small imaging systems, X-ray computed tomography and digital radiography. Early morning refresher courses will be held during the week to review special topics as well and a commercial exhibition featuring the latest products and services from a wide range of companies will take place during the middle part of the meeting.

The website (www.nss-mic.org/2010) is active with complete information on the conference. Please check the web site for current information about the conference. The first call for papers was distributed at the 2009 NSS/MIC and the final call for papers was mailed in January. You can make your hotel reservations now at special rates (including

government rates) at any of the six conference hotels by using the links on the conference website.

The abstract submission page was opened in February. Remember the deadline is 10 May 2010.

Students and new graduates are important to the NSS/MIC and the society. To encourage their participation, several grants are available to attend the conference and short courses. These grants are available due to the generous support of individuals, agencies, and companies. The Paul Phelps Continuing Education Grant, the Valentin T. Jordanov Radiation Instrumentation Travel Grant, and the Conference Trainee Grants will be available. Full details on the requirements, application deadlines, and forms are available on the website. When you submit an abstract, carefully review the options and select the ones you are eligible for.

The Knoxville area is home to many institutions, laboratories, and companies that have been significant contributors to these conferences since their beginning. In fact, the second annual NSS was held in Oak Ridge, TN in 1955 and in 1960 it was held in nearby Gatlinburg, gateway to the Smoky Mountains National Park. Fifty years later the meeting returns to East Tennessee in Knoxville's modern conference facility. The Knoxville area has much to offer the attendees including the unique qualities of autumn in the Smoky Mountains.

This location provides an excellent venue for our professional meeting and ample time for social interaction and exchange of ideas. Companion tours will include several short trips around East Tennessee. These will be both social and historic with visits to Oak Ridge and local museums. Technical tours to ORNL and local companies will also be offered.

Works both ways

...political motivation can be as important as justifying correct views in science as they are in justifying false ones.

Robert Proctor

CONFERENCES

On behalf of the organizing committee, I encourage you to make plans now to attend the 57th NSS of the IEEE Nuclear and Plasma Sciences Society. I look forward to welcoming you to Knoxville in October 2010 for the NSS-MIC-RTSD.

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The excluded middle

He [Teller] was less aware that catastrophes can result from excesses as well as inaction.

Harold Brown and Michael Hoy

Report on the Women in Engineering Session at NSS/MIC 2009

For the second time in the history of the NSS/MIC Conferences, an IEEE Women in Engineering (WIE) Session was held during the 2009 IEEE NSS/MIC in Orlando, FL, following the success in Dresden in 2008. The session, on Wednesday, 28 October 2009, was open to all Conference attendees. The theme of the Session was: “**Fostering better use of the talent pool of women in science & engineering.**” The Session, organized by **Barbara Obryk** (WIE AG Chair) and **Sara A. Pozzi**, has provided an opportunity for exchanging ideas and information on issues of importance not only to the society of women in science and engineering but also of importance to the general public.

At the opening of the Session all attendees were warmly welcomed by the Conference Host, **Richard Lanza**, the General Chair. Then **Craig Woody**, the President of IEEE Nuclear and Plasma Sciences Society, addressed and welcomed the public in the name of our Society that is the NSS/MIC sponsor and organizer.

Eminent guests were introduced at the WIE session, among them were **Mary K. Gaillard**, Professor of Physics at University of California at Berkeley, a Faculty Senior Staff member at Lawrence

Berkeley National Laboratory, a Fellow of the APS and of the American Academy of Arts and Sciences and a member of the National Academy of Sciences and of the American Philosophical Society, and **Karen Panetta**, the WIE Committee Chair, Professor of Electrical and Computer Engineering at Tufts University and Director of the Simulation Research Laboratory at Tufts University. Presentations were started with a talk given by Mary K. Gaillard on “Women in Physics: a Personal Perspective.”

She shared with the audience her broad experience on combining her scientific work in the field of high energy physics with her family life, at which she has succeeded extremely well. She gave snapshots of a life in physics: the delights of scientific discovery, the politics of science, images of women in science, and how they are changing. She also gave her perspectives on attitudes towards women in an international context because approximately half of her career was spent in European research labs. Then Karen Panetta, who is the WIE Committee Chair, spoke in a very vibrant way about the Women in Engineering activities worldwide and shared with the audience

(continued on page 8)



Sara A. Pozzi, University of Michigan and Barbara Obryk, Institute of Nuclear Physics, Krakow, the organizers of the WIE Session at the 2009 IEEE NSS/MIC in Orlando

CONFERENCES



Panel discussion during the WIE Session in Orlando (from left to right): Jennifer Dolan. (University of Michigan), Hailey MacDonald (University of Michigan), Karen Panetta (Tufts University, the IEEE WIE Committee Chair), Barbara Obryk (IFJ Krakow), Sara A. Pozzi (University of Michigan), Mary K. Gaillard (University of California at Berkeley)

Tea time

The records suggest that he [Stanley Baldwin] intervened decisively in the proceedings only when a motion to adjourn was being entertained, and then usually in its favour.

R. MacGregor Dawson

(continued from page 7)

her wide knowledge of how to inspire, engage, encourage, and empower IEEE women and others.

For the panel discussion, the WIE Session Speakers were joined by young women, who have just started their careers in physics and engineering fields: Jennifer Dolan, Ph. D. student at the University of Michigan and Hailey MacDonald, a University of Michigan graduate and an engineer at Disney. The discussion was a valuable contribution to the Session. Having young students as panelists also made the discussion very lively.

At the conclusion of the session a very lively and interesting informal discussion followed when refreshments were served. Karen Panetta answered all questions regarding WIE activities and the WIE advertising materials were distributed among participants. Our WIE Session was a success; several dozens of people attended it. The outstanding contributions

of our speakers and panelists were all-important to this success.

Let us express our deep appreciation for support which our Session received from the Brookhaven National Laboratory and the IEEE Nuclear and Plasma Sciences Society, without which our idea could not have materialized. We also acknowledge the support from the NSS Trainee Grants that covered conference travel for Jennifer Dolan and many other students.

We hope to use the experience that we have gathered this year during the WIE Session at coming NSS/MIC Conferences.

This report was prepared by Barbara Obryk of the Institute of Nuclear Physics (IFJ), Krakow, Poland and Sara A. Pozzi of University of Michigan. More information can be found at: <http://spn-nssmic.ifj.edu.pl/orlando.html> or please contact Barbara Obryk at barbara.obryk@ifj.edu.pl or Sara A. Pozzi at pozzisa@umich.edu.

President's Report

As we start the year 2010, I would like to welcome all of our new IEEE and NPSS Society members and hope that you have already begun to feel a part of the wonderful organization that you have joined. Our Society's membership grew by record proportions last year, thanks in a large part to our excellent staff of recruiters led by our Membership Chair Uwe Bratzler and the great behind the scenes efforts of Vern Price who keeps track of all of the new membership forms and paperwork (which is a big job, and we owe a special thanks to Vern for doing all that). Membership in NPSS grew by 10.9% in December alone, which was the second largest increase of all Societies within IEEE. Also, membership in IEEE as a whole rose by 3.8% in 2009, bringing the total membership to a record 379,000 members, making it the second largest annual gain in membership since 1963. I would say that shows that both IEEE and NPSS truly have something good to offer, and we are very happy that more people are joining us.

I would like to welcome three new Technical Committee Chairs whose terms started on January 1, 2010. Robert Miyaoka is now heading our Nuclear Medical and Imaging Sciences Council (NMISC), Stefan Ritt has taken over as Chair of Computer Applications in Nuclear and Plasma Sciences (CANPS), and Dennis Youchison is now chairing our Fusion Technology Standing Committee. Dan Fleetwood assumed the chairmanship of the Radiation Effects TC in July, but just assumes this position with AdCom now. We would also like to thank Charles Watson, Jean-Pierre Martin, Tim Oldham, and Mark Tillack for the excellent job they did serving as the previous Chairs of these committees. Also, I am sorry to report that Peter Winokur has had to step down as the Chair of our Fellows Committee due to

increased responsibilities in his day job. Peter was nominated to become the Chair of the Defense Nuclear Facilities Safety Board by President Obama last fall, and while we are proud to have one of our own NPSS members in this important and high level position in Washington, we are sorry that Peter will not be able to spend as much time with us on AdCom as he has done in the past. Peter did a superb job in helping to elevate many of our well deserving NPSS members to the rank of Fellow within IEEE, and had an excellent success rate with our candidates within the National IEEE Fellows Evaluation Committee. Our Past President (and Fellow) Jane Lehr, will be assuming the Chair of our Fellows Committee, and I'm sure she will be just as successful as Peter was in obtaining this high level of recognition for our members.

I would also like to welcome our five newly elected AdCom Members, who are Christian Bohm (CANPS), Gerald Cooperstein (Pulsed Power), Paul Dodd (Radiation Effects), Glenn Knoll (Radiation Instrumentation) and John Verboncoeur (Plasma Sciences), and thank our two outgoing members, Dan Fleetwood and Tony Peratt for all the work they did during their successful terms. This was also the first AdCom election where we allowed members to vote either electronically or by conventional paper ballot, and there were indeed a few glitches. Not everyone received their paper ballots on time, and some people did not initially see the entire list of candidates on the electronic ballot. It took some time before all the bugs were ironed out, but in the end, the process worked and the response was excellent. We received many more votes than we usually do using only paper ballots, and most people felt that electronic balloting was a definite improvement. However,

(continued on page 10)



Craig Woody
NPSS President

Idée fixe

When the facts change, I change my mind. What do you do, Sir?

John Maynard Keynes

...but unbowed

The trouble with socialists is that they let their bleeding hearts go to their bloody heads.

Jimmy Thomas

(continued from page 9)

we also noticed some peculiarities with the electronic balloting. We found that some candidates for some of our Technical Committees received many more votes than would be expected from the estimated number of members of that Technical Committee. This could perhaps be because some people felt that they should vote for all open positions in the election, even if they were not familiar with the candidates or the activities of each Technical Committee. This can have an influence on the results, so the message here is that please do vote for any and all candidates that you feel you know and have an educated opinion about, but please do not feel compelled that you must vote for every position on the ballot.

It is also my pleasure to announce the formation of the Richland Section Nuclear and Plasma Sciences Society Chapter that was officially approved on October 26, 2009. Brian Milbrath is the President of our newest Chapter and is already working on Chapter activities in that area. The Richland Section includes Pacific Northwest National Laboratory, and is home to many of our current and active members, including our own Society Webmaster, Dick Kouzes. This brings our current total to 18 NPSS Chapters, and I'm sure the number will continue to grow.

A word of interest for our members who publish papers in our *Transactions on Nuclear Science* or the *Transactions*

on Medical Imaging. As many of you may know, NIH now requires that all published papers supported by NIH be made public within one year after publication on PubMed Central, which is NIH's free digital archive of biomedical and life sciences journal literature. Many publishers now automatically submit such papers after they have been published to PubMed, eliminating the need for authors to do so on their own. Our NPSS AdCom, in accordance with the request of NMISC, along with the TMI Steering Committee, have now asked the IEEE Publication Services and Products Board to also do this for papers that have been published in Xplore. This issue will be taken up at the PSPB meeting in February, and we are hopeful that IEEE will change its publication procedure to provide this service to our authors.

To end on a positive note, I am happy to report that our Society's finances are doing very well again after going through some difficult times during the financial crisis of 2008 and part of 2009. Our income over expenses was quite good in 2009, thanks to our many successful conferences and publications, and our reserves are healthy again. So, things are looking up, and we are hoping for another successful year in 2010.

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

Secretary's Report

The Annual Meeting of the IEEE Nuclear and Plasma Sciences Society was held on Saturday, 31 October 2009 at Hilton Hotel and Resort at Disney World in Orlando, Florida. In addition to AdCom members, Robert Miyaoka, the incoming NMISC chair, and Travel Destinations Management Group, Inc. (TDMG) staff members Buzz Levin, Wendy Passavito and Danielle Giroux were visitors. Our treasurer, Ed Lampo, noted that all 2008 conferences were closed but lots of work remains for 2009. Financially we ended the year a bit better than expected due to some lower-than-expected costs and some improved sales of publications. Our president, Craig Woody, announced that Peter Clout was elected as Division IV Director-elect. This is well deserved and we're very proud of Peter, who will do an outstanding job. Uwe Bratzler was also recognized as the top IEEE membership recruiter. Growth in 2009 was very high. Retention is now the key!

We are also assessing our position in regard to the resurgence of interest in nuclear power. From the 1970s into the late 1990s we sponsored the SNPS conference which focused on nuclear power plant instrumentation. We continue with our strong interest in fusion technology and interest in that community is growing. We plan to look in greater depth at where we fit.

The beta version of Technology Navigator has been released. We have a lot of work to do to add in relevant keywords for our society.

TDMG made a presentation about what their capabilities are and what they do for NSS/MIC.

TECHNICAL COMMITTEE REPORTS

The CANPS Committee reported that production and mailing of the conference record CD from the May Real Time

conference in Beijing was behind schedule. A disappointing 114 of 185 papers were submitted. In Beijing there were a great many student attendees. The 17th Real Time conference, chaired by Prof. Carlos Varandas, will be held this year in Lisbon—note the change to an even year!

The Fusion TC has new members, Brad Nelson, Dennis Youchison, who will take over as Chair, Satoshi Konishi from Kyoto and Hans-Stefan Bosch who are the first international members. The 2009 SOFE meeting was held jointly with ICOPS and will be again in 2011. This is the first time that there will be a special issue of the *Transactions on Plasma Science* based on papers submitted from the SOFE conference. Dave Ruzic and J-P Allain are the guest editors. It will include 58 papers. They also report having a very positive experience working with IEEE Conference Services that led to some good savings. Charles Neumeyer will chair the 2011 conference in Chicago with Brad Nelson as the program chair. They are proposing to meet with PPPS in San Francisco in 2013, but no final decision was made.

Nuclear and Medical Imaging and Radiation Instrumentation both have elected new TC members. Robert Miyaoka is the new NMISC chair and Suliman Surti is the vice chair. The committees are working on updating the governance of their Joint Oversight Committee that acts as the site selection committee, among other jobs. The NSS/MIC conference was again a great success with over 1800 participants—the largest North American conference to date. The 2010 Conference, with the Room Temperature Semiconductor Detectors Workshop, will be held in Knoxville, TN, the 2011 conference is scheduled



Albe Larsen
NPSS Secretary and Newsletter Editor

Perish the thought

This is the age of the conditioned reflex rather than the reflective condition.

David Lewis

(continued on page 12)

Dead right

*Pale Ebenezer thought it wrong
to fight.*

*But Roaring Bill, who killed him,
thought it was right.*

Hillaire Belloc

(continued from page 11)

for Valencia, Spain, and the 2012 conference will be in Anaheim. Following the AdCom meeting, Seoul, Korea was selected for the 2013 venue.

The Plasma Science and Applications TC met the day following the AdCom meeting. Their 2010 conference will be in Hampton Roads, VA and their 2011 conference, with Fusion, will be in Chicago, following the Pulsed Power Conference. The 2012 conference will be in Edinburgh, Scotland.

The Pulsed Power conference, held in June in Washington, DC, had a very successful new member drive under Dan Jobe. The conference again faced foreign visa challenges and many foreign delegates were unable to get their visas cleared in a timely way. Proceedings should be out now. The abstract deadline for 2011 will be earlier to help with the visa issue. The 2011 conference venue is the Hyatt Regency McCormick Place, Chicago, and 2013 will be a PPPS conference in San Francisco. The TC presently has 8 members from DOE/DOD, 6 from academia, 2 from industry and one from government. Their constitution and bylaws are under review.

The Radiation Effects TC held its 2009 NSREC conference in Quebec, with higher than anticipated attendance. International attendance was up, and Canadian attendance went from 10 at the 2001 Vancouver conference to 28 in Quebec. Dan Fleetwood is the new TC chair. Future conferences: 2010—Denver; 2011—Las Vegas; 2012—Miami, 2013 site selection in process.

FUNCTIONAL AND APPOINTIVE COMMITTEES AND LIAISONS

We are using IEEE Meeting Planning Services help for site selection and for contract review. A big meetings issue is technically cosponsored conferences. We have to monitor quality closely,

principally by heavy society involvement. We also don't want to promote competitors to our own conferences. Our Conferences chair, Bill Moses, is also looking into standardized post-conference reporting to facilitate data collection.

This is the first year in which nominations for the Curie Field Award have been solicited. Listen for more about this.

Membership has grown to over 3400 under Uwe Bratzler's committee chairmanship, with lots of help from Vern Price and a good team of membership desk staff. 63% of members are from Regions 1-7 (North America) and 37 % from Regions 8-10 (Asia and Pacific, Europe, Middle East, Africa, South America). Greatest growth continues in Regions 8-10, and among students.

We now have 18 chapters with new chapters forming regularly. Is there a chapter near you? Steve Gold, the Chapters chair, can help you find a chapter, or can help you start a chapter. Remember, our Distinguished Lecturers are available to speak at Chapter and Student Chapter meetings

Peter Winokur, because of new work responsibilities, has stepped down as Fellow Candidate Evaluation Chair. Our Fellows Class of 2010 is robust—see the Awards section below.

Jane Lehr, our Nominations chair, reported some problems with the electronic balloting used for the 2009 elections, but we had a good rate of response, and bugs are being resolved.

Ithenticate is the new Publications tool that allows a search for plagiarism and self plagiarism in articles submitted for publication in IEEE journals. It is used for all NPSS-sponsored journals.

The Publications Committee petitioned PSPB to take publication of this Newsletter outside IEEE. Permission was granted at the November TAB

meeting which happened after our AdCom meeting. The request was made because IEEE rather arbitrarily decided to outsource Newsletter production and left all communication between newsletter production and the editor in the hands of an albeit willing and hard working, but seemingly overwhelmed middleman, and it caused huge inefficiencies in the production process and every issue from June through December had problems that could have been averted with better communication and control. In addition, it was felt that the time had come to change our face and there were really no graphics design staff left to do that.

The Communications Committee, led by Peter Clout, has worked to have the web site revamped. There are templates for materials if committees providing input choose to use them—or should use them for pages linked from another server to our web server. Updates are needed, so make sure your committees are up-to-date!

The Standards Committee continues with updating and requalifying our standards.

Our Transnational Liaison, Patrick LeDû and Transnational Committee Chair and AdCom member, Jean-Luc Leray are working on making it easier and more transparent to conduct international meetings. Learning how different cultures function is important, and learning how to work in different financial systems is also important. The Transnational Committee is developing operating protocols, and is working on its web pages. They are also trying to broaden their technical community and regional representation while keeping the committee at a workable size.

Our interest in nuclear power instrumentation has resumed and is growing. A new committee under Dick Kouzes is tracking our involvement with technically cosponsored conferences and with developing NSS sessions. This is a watch carefully and see where we go effort for now.

The Humanitarian Technology Challenge is moving forward vigorously. Ray Larsen, the liaison and very active member attended a workshop in Washington and is heavily involved in a committee working to bring electricity to remote areas of the third world on a sustainable basis with a sound business plan. Since the Haitian earthquake, work has intensified and NGO and financial partners and plans are in process. Karl Perusitch, the president-elect of the Society for Social Implications of Technology (SSIT) is among those involved.

A new standards committee to develop ATCA standards for the scientific community (high energy physics, fusion, among others) has been formed under the PICMIG group. While not an IEEE committee, NPSS members are heavily involved.

Our relationship with the ICALEPS Conference that we have technically cosponsored for years is uncertain.

Our GOLD event at the NSS/MIC meeting was highly successful and will be tried at other conferences.

Gerry Rogoff, our liaison to the Coalition for Plasma Science, was with us and reported on their continuing activities in educating both congressional people—Congress members and staffers—as well as K-12 teachers about plasma sciences. They have a good web site with downloadable two-page educational fliers on various aspects of plasmas and plasma sciences. They also help PSAC in judging at the INTEL Science Fair for the Plasma Award. They get all kinds of miscellaneous inquiries that they work to handle. This organization continues to do an impressive job!

The Sensors Council continues to hold meetings that overlap with ours so attending them is difficult.

(continued on page 14)

Smart move

It is impossible to underrate human intelligence—beginning with one's own

Henry B. Adams

Enrol now!

*The proper study of mankind
is woman.*

Henry B. Adams

(continued from page 13)

RADECS has meetings scheduled to 2013. They have a conference every year now, but in alternating years they also offer a short course.

Women in Engineering now has liaisons from 22 societies and councils of whom only 9 attended the Orlando meeting. Travel, except for that of the 10 voting members, is supported through societies, not through the limited WIE budget.

David Abe has taken on the role of liaison to the Biometrics Council. Our interest is in THz sources.

The MI liaisons report that TMI is doing well, papers are going into PubMed, that there will be a new editor, and that page charges have been increased. Papers are generally 10-11 pages.

ADCOM ACTIONS

- It was moved and seconded by the Pulsed Power TC that the IEEE NPSS technically cosponsor the 2010 IEEE DEIS Power Modulator Conference, High Voltage workshop because of their substantial and substantive participation in the technical program. The motion carried.
- It shall be the policy of AdCom that travel of voting members and functional committee chairs to AdCom meetings

shall be reimbursable whenever such travel is not associated with conferences in the member's field of interest. Such travel must be accomplished by the most cost-effective means. This motion was passed as an amendment to a motion of July 2008 increasing the AdCom travel allowance for voting AdCom members and technical and functional committee chairs.

- It was moved, seconded and defeated that the NPSS will provide \$5,000 in direct support to the IEEE Women in Engineering Committee (WIE) in 2010. The purposes of the funding are (1) to defray part of the \$100,000 annual cost of the WIE Magazine, and (2) to demonstrate the interest of the NPSS in continuing the functions of the WIE
- It was moved, seconded and passed that the dollar amount for the NPSS Graduate Scholarship Award be increased from \$750 to \$1500 per awardee.
- It was moved, seconded and defeated the NPSS technically cosponsor the NEET conference in 2010.

Albe Larsen, NPSS Secretary and Newsletter Editor, can be reached at the SLAC National Accelerator Laboratory, 2575 Sand Hill Road, Menlo Park, CA 94025; Phone: 650-888-8897; Fax: 650-726-0368; E-mail: amlarsen@slac.stanford.edu.



Christian Bohm

New AdCom Members

CHRISTIAN BOHM
**Computer Applications in
Nuclear and Plasma Sciences**

My Ph.D. at Stockholm University was in applied nuclear physics, using Mössbauer spectroscopy to study metal surfaces. A large part of the research dealt with the development of an electrostatic electron spectrometer along with its

data acquisition system. While doing this I also worked with pulse timing and tomographic reconstruction algorithms together with Z.H. Cho. In 1973 we published a filtered backprojection method similar to Shepp-Logans. From 1976 I worked with L. Eriksson to develop the first two Swedish PET cameras. The second camera was

developed together with the Swedish cyclotron manufacturer Scanditronix, who later marketed the system. After some successful years the PET-camera division was sold to General Electric, starting their commercial production of PET cameras.

In 1987 I was appointed full professor in instrumentation physics at the University of Stockholm. Here the research was aimed at the development of advanced physical measuring systems, in particle and nuclear physics as well as nuclear medicine. The main part of the research was done in different developmental research projects.

Our major projects concerned particle physics applications at CERN. We have

been responsible for part of the ATLAS first-level trigger and for the digitization system at the ATLAS hadron calorimeter and are now involved in upgrade activities. We have also been involved in the Ice-cube neutrino telescope project at the South Pole and in the development of XFEL at DESY.

During the years I have been active in the organization of several international (IEEE) conferences in different capacities. My involvement in IEEE started 1972 when I attended my first NSS conference. I have since then participated in many such meetings and enjoyed them professionally as well as personally.

Christian Bohm can be reached by E-mail at bohm@physto.se.

GERALD COOPERSTEIN

Pulsed Power Science and Technology

Gerald Cooperstein received both his BS degree in physics in 1963 and PhD degree in experimental high-energy physics in 1968, from the Massachusetts Institute of Technology. His first two positions were with EG&G and Ion Physics Corporation in Massachusetts. He joined the Naval Research Laboratory (NRL) in 1971 as a section head in the Plasma Physics Division where he was responsible for intense electron beam research on the Gamble I high-voltage, pulsed-power generator. He is currently the head of NRL's Pulsed-Power Physics Branch, which is responsible for research in intense electron and ion beams, intense X-ray sources, electromagnetic launchers, plasma opening switches, and inductive energy storage.

Dr. Cooperstein has an exceptional record of achievement for over three decades in the technology and applications of high-voltage pulsed-power with emphasis on intense electron and ion beam generation. He was elected a Fellow of the American

Physical Society in 1987 and Fellow of the IEEE in 1999. He was a guest editor of an *IEEE Transactions on Plasma Science Special Issue* (December 1987), devoted to plasma opening switches, and one devoted to pulsed-power science and technology (April 1997). He was co-chair of the 1992 BEAMS conference in Washington, DC, technical chair of the 1995 Pulsed Power Conference (PPC) in Albuquerque New Mexico, and chair of PPC97 in Baltimore, Maryland. He also served as co-editor for all three conferences proceedings. He received the 1999 IEEE Peter Haas Pulsed Power Award, and the 2007 NRL Sigma Xi Applied Science Award. He has authored or co-authored over 150 publications on the subjects of high-voltage pulsed-power, intense electron and ion beams, intense X-ray sources, and plasma opening switches.

Gerald Cooperstein can be reached at the Naval Research Lab, Code 6770, 4555 Overlook Ave. SW, Washington, DC 20375-5346; Phone: +1 202 767-2290; Fax: +1 202 767-0436; E-mail: cooperstein@nrl.navy.mil.



Gerald Cooperstein



Paul E. Dodd

(continued from page 15)

PAUL E. DODD **Radiation Effects**

Paul Dodd's biography appears elsewhere in this issue of the Newsletter as a newly elevated IEEE Fellow. Paul is a Principal Member of the Technical Staff at Sandia National Laboratories, where he is involved in the development of Sandia's radiation-hardened microelectronic

technologies, the computer simulation of radiation effects on microelectronics, and radiation hardness assurance activities for Sandia systems. He has been active in the NPSS Radiation Effects Committee for more than 15 years as a technical contributor and has served in numerous positions on NSREC conference committees, most recently as General Chair of the 2008 NSREC held in Tucson, AZ.

*Paul Dodd can be reached by
E-mail at pedodd@sandia.gov.*



Glenn F. Knoll

GLENN F. KNOLL **Radiation Instrumentation Technical Committee**

Glenn Frederick Knoll is Professor Emeritus of Nuclear Engineering and Radiological Sciences at the University of Michigan. Following his undergraduate education at Case Institute of Technology, he earned a Master's degree from Stanford University and a doctorate in Nuclear Engineering from the University of Michigan. He joined the Michigan faculty in 1962, and served as Chairman of the Department of Nuclear Engineering from 1979 to 1990, and as Interim Dean of the College of Engineering in 1995-96. His research interests have centered on radiation measurements, nuclear instrumentation, and radiation imaging. He is author or co-author of over 200 technical publications, 7 patents, and 2 textbooks.

He has been elected a Fellow of the American Nuclear Society (ANS), the Institute of Electrical and Electronics Engineers (IEEE), and the American Institute for Medical and Biological Engineering. He has been chosen to receive four national awards given

annually by professional societies: the 1979 Glenn Murphy Award of the American Society for Engineering Education, the 1991 Arthur Holly Compton Award of ANS, the 1996 Annual Merit Award of the Nuclear and Plasma Sciences Society (NPSS) of IEEE, and the 2007 Outstanding Achievement Award from the Radiation Instrumentation Awards Committee of NPSS/IEEE. His textbook **Radiation Detection and Measurement** (Wiley, 3rd Edition, 2000) is widely used throughout the world, and a Fourth Edition is in preparation. In 1999 he was inducted into membership in the National Academy of Engineering. In 2000 he received the highest faculty award from the College of Engineering of the University of Michigan, the Stephen E. Attwood Award. He has served as consultant to 35 industrial and governmental organizations in technical areas related to radiation measurements, and continues in an advisory capacity to several agencies of the U.S. Government. He is a Registered Professional Engineer in the State of Michigan.

*Glenn Knoll can be reached by
E-mail at gknoll@umich.edu.*

JOHN P. VERBONCOEUR

Plasma Science and Applications

John P. Verboncoeur (S'08-M'96) received a B.S. (1986) in Engineering Science from the University of Florida and a M.S. (1987) and Ph.D. (1992) in Nuclear Engineering from the University of California at Berkeley (UCB), holding the DOE Magnetic Fusion Energy Technology Fellowship. As a postdoc at UCB and Lawrence Livermore National Laboratory, he worked on bounded and collisional plasma models and applying object-oriented technology to computational plasma physics. He was appointed Associate Professor in Residence at UCB in 2001, and full Professor in 2008. He currently leads the Computational Engineering Science program at the UCB. His research interests are in theoretical and computational plasma physics, broadly defined to include electromagnetics, vacuum electronics and microwave devices, beam optics, plasma discharges

and devices, fusion energy, and numerical methods. He is the author/coauthor of the Berkeley suite of particle-in-cell Monte Carlo collision (PIC-MCC) codes, including XPDP1 and XOOPIIC, used by over 1,000 researchers worldwide with over 250 journal publications in the last decade. He has authored/coauthored over 60 journal articles, and has taught ten international workshops and mini-courses on plasma simulation. He has also worked on a number of nonacademic projects including the Strategic Air Command Executive Support System, the U.S. Postal Service Mail Forwarding System, and the TRW Credit Data Consumer Report System, in addition to developing and licensing a number commercial hardware and software tools.

John Verboncoeur, Professor in Residence, can be reached at 4167 Etcheverry Hall; Dept. of Nuclear Engineering, University of California, Berkeley, CA 94720-1730; Phone: +1 510 642-3477; E-mail: johnv@nuc.berkeley.edu.



John P. Verboncoeur

New Technical Committee Chairs

DANIEL M. FLEETWOOD

Dan Fleetwood is the newly elected Chairman of the Radiation Effects Committee (REC) of the IEEE NPSS. The REC provides oversight for the IEEE Nuclear and Space Radiation Effects Conference, and supports the dissemination of knowledge about radiation effects on microelectronic and photonic devices. Dan received B.S., M.S., and Ph.D. degrees from Purdue University in 1980, 1981, and 1984. He joined Sandia National Laboratories in 1984 as a Member of the Technical Staff. In 1990, he was named a Distinguished Member of the Technical Staff in the Radiation Technology and Assurance Department at Sandia. Dan accepted a position as Professor of Electrical Engineering at Vanderbilt University

in 1999, and also holds a secondary appointment as Professor of Physics.

In 2001-2003 he served as Associate Dean for Research in the School of Engineering. In 2003 he was named Chairman of Vanderbilt's Electrical Engineering and Computer Science Department, and in 2009 he was named Olin H. Landreth Professor of Engineering. Dan is author or co-author of more than 340 publications on radiation effects and low frequency noise, which have been cited more than 6,000 times. In 2009 Dan received the IEEE NPSS Merit Award for contributions to the understanding of radiation effects in microelectronic materials and devices. He has served the IEEE Nuclear and



Daniel M. Fleetwood

(continued on page 18)

(continued from page 17)

Space Radiation Effects Conference (NSREC) previously as Executive Vice-Chairman of the Radiation Effects Steering Group for the IEEE NSREC, as general chair (2004), short course chair and presenter, technical program chair, poster session chair, guest editor, and session chair; he has also been an invited speaker and short course presenter at the RADECS Conference. Dan also was Vice-Chairman for Publications for the RESG, 1994-1997, and Guest Editor of the April 1996 issue of the *IEEE Transactions on Nuclear Science* on single event effects and the space radiation environment. Dan has received seven IEEE NSREC outstanding paper awards, as well as several meritorious conference paper awards. In addition, Dan was local arrangements chair, technical program

chair, and general chair of the IEEE Semiconductor Interface Specialists Conference (1997-1999), is a member of the Editorial Advisory Board of Microelectronics Reliability, and served, in 2005, as chair of the American Physical Society (APS)'s Forum on Industrial and Applied Physics. Dan is a Fellow of the IEEE and the APS, and is also one of eight Americans to earn the International Correspondence Chess Grand Master title (2008).

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



Robert Miyaoka

ROBERT MIYAOKA **Nuclear and Medical Imaging Sciences**

Robert Miyaoka received a BS degree in General Engineering from Harvey Mudd College in 1983. After briefly working for Hughes Aircraft Company, he went on and received his MS and PhD degrees in Electrical Engineering from the University of Washington in 1987 and 1992, respectively. He currently is a Research Associate Professor in the Department of Radiology and an Adjunct Associate Professor in the Department of Electrical Engineering at the University of Washington. He serves as Director of the Small Animal PET Imaging Resource at the University of Washington. He has over 20 years of experience in nuclear medicine instrumentation and physics research. His research has included time-of-flight PET and dual-head coincidence imaging. He also has developed a series of micro crystal element (MiCE) detectors for high resolution PET imaging. His

recent efforts have focused on PET detector designs that provide depth of interaction positioning and support multi-modality imaging. His research interests also include preclinical PET imaging.

Dr. Miyaoka has been an active member of the IEEE and NPSS for over 13 years. He is a Senior Member of the IEEE and has served as an Associate Editor for the *IEEE Transactions on Nuclear Science* since 2007. Prior to becoming Chair of NMISTC, Dr. Miyaoka served as Vice Chair of NMISTC for two years and also served on the NMISC Awards Committee in 2006 and 2007. Dr. Miyaoka was the MIC Deputy Chair in 2002 and will be the NSS/MIC Local Arrangements Chair in 2012.

Robert Miyaoka can be reached at the University of Washington, Department of Radiology, Box 357987. Seattle, WA 98185; Phone: +1 206 543-2085; Fax: +1 206 543-8352; E-mail: rmiyaoka@u.washington.edu.

STEFAN RITT

Computer Applications in Nuclear and Plasma Sciences

Stefan Ritt received his Ph.D. in particle physics from the University of Karlsruhe, Germany, in 1993. Since then he has been employed by the University of Virginia, Charlottesville, and the Paul Scherrer Institute in Switzerland. He was responsible for the design, commissioning and data taking of the PIBETA and the MEG experiments at PSI, both being medium-sized particle physics experiments searching for new physics beyond the Standard Model. These challenging experiments need a set of critical ingredients for instrumentation: good software and good hardware. Instead of using existing suboptimal solutions, Stefan went his own way. He started the development of the MIDAS data acquisition system, later adopted by TRIUMF, Canada. It soon became clear that if specific work is done more generally, it can be easily used by other laboratories and institutions, having some impact on the community and bringing physics and engineering a step further. So the MIDAS system became a general purpose DAQ system, which is now used by many other experiments. It was later complemented by the MSCB slow control system and the ELOG electronic logbook software, the latter now being used worldwide including all LHC experiments.

After completing the software, Stefan focused more on the hardware side. Most experiments in particle and nuclear physics need fast waveform digitizers in the giga-sampling range, where one usually uses flash ADCs, which are expensive and power hungry when it comes to thousands of channels. An alternative approach is to use so-called Switched Capacitor Arrays. Based on an earlier development, Stefan designed the DRS series of chips, which now outperform most other digitizing systems. With the help of PSI's technology transfer program, the DRS4 chips are now shipped worldwide, equipping other experiments mainly in gamma ray astronomy with thousands of channels, hopefully bringing the field another step further.

Stefan was the CANPS elected member of AdCom (2007-2009), served as an Associate Editor of the *Transactions on Nuclear Science* (2005-2009), is member of the NPSS awards committee and has been involved in the organization of the Real Time Conference since 2003.

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.



Stefan Ritt

DENNIS L. YOUCHISON

Fusion Technology

Dennis L. Youchison, a distinguished member of the technical staff in the Fusion Technology Department at Sandia National Laboratories, received a B.S. (1982), an M.S. (1984), and his Ph.D. (1989) in nuclear engineering from the Pennsylvania State University. He is a licensed professional engineer in the state

of New Mexico. His research has focused on the development of materials for extreme environments and the design of plasma-facing components and advanced high-temperature heat exchangers for fusion reactors. While at Penn State, Dr. Youchison set up a hot metallurgy laboratory to test neutron-irradiated materials used in the nuclear power industry. His dissertation research at the



Dennis L. Youchison

(continued on page 20)

Poor us!!

Every country has the government it deserves.

Joseph de Maistre (circa 1800)

(continued from page 19)

Westinghouse R&D Center involved ion beam measurements of sputtering yields for redeposited graphite and beryllium plasma-facing surfaces. From 1990 to 1993, he was employed at the Surface Modification Branch of the Naval Research Laboratory (NRL). At NRL, he performed experiments to characterize plasmas used in electron cyclotron resonance plasma-assisted chemical vapor deposition of superhard coatings including nanocrystalline diamond and cubic boron nitride films. Employed at Sandia since 1993, Dr. Youchison is responsible for performing experiments in the Plasma Materials Test Facility (PMTF) and coordination of the PMTF User Facility. These experiments include both high heat flux testing and electron

beam thermal processing of materials. He has worked on fusion projects such as TPX, ITER and FIRE. His present research interests include high heat flux testing of plasma-facing components, computational fluid dynamics, heat transfer in porous media, physical vapor deposition, plasma-material interactions, particle beam technology and the development of test diagnostics.

He has chaired the Fusion Technology TC's Symposium on Fusion Engineering and been a member of the program and paper review committees.

Dennis Youchison can be reached at Sandia National Laboratories, Fusion Technology Dept. 01658, PO Box 5800, MS-1129, Albuquerque, NM 87185-1129; Phone: +1 505 845-3138; Fax: +1 505 845-3130; E-mail: dlyouch@sandia.gov.

TECHNICAL COMMITTEES



Stefan Ritt
CANPS Chair

COMPUTER APPLICATIONS IN NUCLEAR AND PLASMA SCIENCES

This is my first report to you as CANPS chair. First of all, I would like to thank the previous chair Jean-Pierre Martin for his excellent work. He brought the Real Time conference a big leap forward during his term. I have already learned a lot from him and want to continue to run the CANPS in his spirit. Then I would like to welcome Patrick Le Dû as the new "CANPS-NPSS liaison." His position will allow him to continue to help with organizing the Real Time conference in the great enthusiastic way that he has in the past. The new CANPS elected AdCom member is Christian Bohm, who organized the RT-2005 in Stockholm very nicely and who has been a RT committee member for many years.

Things are getting pretty busy already for the upcoming 17th Real Time conference 23-28 May 2010 in Lisbon, Portugal. As reported previously, the odd-year cycle

has been switched to an even-year cycle to avoid conflicts with other conferences. The conference is organized by Carlos Varandas from the Instituto de Plasmas e Fusão Nuclear (IPFN) together with the Laboratório de Instrumentação e Física Experimental de Partículas (LIP). Both institutes are involved in the ITER international fusion reactor project, which will strengthen the contribution from the fusion field to the conference program.

The program chair of RT-2010 is Patrick Le Dû, who will again assemble a very attractive program with many highlights of real time application not only from particle and nuclear physics but also from various other fields such as fusion, medical and security applications. The CANPS will present senior and student awards. Jean-Pierre Martin, Réjean Fontaine and Michael Levine have been nominated to form the award committee. The poster session will be organized by Christian Bohm, and will be accompanied by

TECHNICAL COMMITTEES

“mini-oral poster presentations.” These 3-minute oral presentations have been extremely successful in the previous RT conferences to highlight the posters to the general audience. We will again follow the all-plenary concept, to give everybody the opportunity to see how experts in completely different fields solve real time problems very similar to their own. The real-time conference will be preceded by

an xTCA workshop and short courses including live demonstrations. More information can be found on the web site at <http://rt2010.ipfn.ist.utl.pt>

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.

NUCLEAR MEDICAL AND IMAGING TECHNICAL COMMITTEE

Greetings, as 2010 begins and I take over as Chair of NMISTC, I would like to thank Charles Watson for the excellent job that he did during his two years as Chair. Charles oversaw the renaming of the Young Investigator award in honor of Bruce Hasegawa, increasing the amounts of the Hasegawa and Hoffman awards, and the revision of our bylaws concerning the NSS/MIC Oversight Subcommittee. Items begun under his tenure are a redesign of our website (<http://ewh.ieee.org/soc/nps/nmisc/>) for consistency with our parent NPSS website and providing support to urge IEEE Publication Services and Products Board (PSPB) to implement automatic submission of *IEEE TNS* and *TMI* Journal manuscripts to PubMed Central. The motivation for automatic article submission by PSPB from journals such as *Transactions on Nuclear Science* (TNS) and *Transactions on Medical Imaging* (TMI) is an NIH requirement for all papers resulting from NIH-funded research to be submitted to PubMed Central within one year of their publication. While many journals perform this submission automatically for authors, IEEE journals currently do not. Since many of our constituents receive NIH funding, this service would continue to promote the submission of their high quality work to *IEEE TNS* and *TMI*.

In a vote, the NMISC unanimously supported this motion and AdCom has supported this measure.

In new news, election results for the Nuclear Medical and Imaging Sciences Council are in and I would like to congratulate Paul Rene, Michel Lecoq, Jinyi Qi, Vesna Sossi, Stefan Tavernier, and Dimitris Visvikis on their election to the council and thank them for their willingness to serve. Their three-year terms started January 1st, 2010. Suleman Surti was elected as NMISTC Vice Chair. His appointment also began on January 1st, 2010. He will become NMISTC Chair in 2012. If you have a wish to serve on the NMISC or know someone whom you think would make a good council member contact George Kontaxakis, Secretary and Chair of the Nominations Subcommittee, at g.kontaxakis@ieee.org. Self-nominations are accepted and encouraged.

To recap the 2009 IEEE NSS/MIC, we had another outstanding meeting led by General Chair Richard Lanza, MIC Program Chair Ramsey Badawi, and MIC Deputy Chair Craig Levin. Between the NSS and MIC, we had 1803 attendees. The MIC scientific program presented work of excellent quality. There were 87 oral presentations (3 invited talks) and 404 poster presentations (including 47

(continued on page 22)

Zero sum game

In the end, it seems we can't know everything about something until we know more than a little about nothing

Amanda Gefter



Robert Miyaoka

TECHNICAL COMMITTEES

(continued from page 21)

premium posters), with premium posters being a new addition to the conference. Premium posters were high scoring abstracts that the program committee could not fit within the limited number of oral presentation slots. Student poster awards were also presented at this past year's meeting. Congratulations to Sara St. James (first place) for her poster entitled: 'ZIPI: A Single Detector Insert to Locally Improve the Sensitivity and Spatial Resolution of Small Animal PET' and Peter Olcott (second place) for his poster entitled: 'Cross-strip Capacitive Multiplexing and Electro-optical Coupling for Silicon Photomultiplier Arrays for PET Detectors.' Additional congratulations to A. Ferrero (third place), Vincent Keereman (fourth place), S.H. Maramraju (fifth place) and Yanguang Lin (sixth place) for their outstanding poster contributions.

The IEEE NSS/MIC also provides our yearly opportunity to honor our colleagues for their outstanding contributions to our field. This year's winners of the Edward J. Hoffman Medical Imaging Scientist and the Bruce Hasegawa Medical Imaging Conference Young Investigator Awards were Benjamin M. W. Tsui and Katia Parodi, respectively. Ben received the award "for contributions to development of digital phantoms and quantitative SPECT methods." Katia received the award "for contributions to PET applications in ion beam radiotherapy." In addition to the Hoffman and Hasegawa awards, this past year's NPSS Early Achievement Award was given to Jinyi Qi. Jinyi received this award "for contributions to computational nuclear medical imaging science, particularly statistically-based three-dimensional image reconstruction." Jinyi was honored in the June 2009 NPSS newsletter.

This year's meeting (2010) will be held in Knoxville, Tennessee. Ron Keyser is the General Chair; David Townsend serves

as the MIC Chair and Charles Watson as the MIC Deputy Chair. The meeting will be held in the Knoxville Convention Center with housing shared among several downtown hotels.

In 2011, the meeting will be heading back to Europe to Valencia, Spain. David Townsend is the General Chair, Alberto Del Guerra will serve as MIC Chair and Juan José Vaquero will serve as MIC Deputy Chair. Valencia is Spain's third largest city, situated on the eastern Mediterranean coast, with many cultural and recreational attractions. The meeting will be held in the Valencia Conference Center and the neighboring Sorollo and Hilton Hotels.

In 2012, the IEEE NSS/MIC meeting will be held in Anaheim, California. Tom Lewellen is the General Chair, Vesna Sossi will serve as MIC Chair and Alex Converse will serve as MIC Deputy Chair. The meeting will be held at the Disneyland Hotel.

In 2013, the IEEE NSS/MIC meeting will be held in Asia for the first time. Host city for the meeting will be Seoul, South Korea. There were three strong proposals to host this meeting: Seoul, South Korea; Beijing, China; and Cairns, Australia and only after lengthy deliberations did the Site Selection Committee choose Seoul. It was exciting to see such enthusiastic interest from our Asian-Pacific members. And just as European membership has grown after the first IEEE NSS/MIC meeting was held in Europe (Lyon, 2001), we look forward to continued growth and participation from the Asian-Pacific community.

While the NMISC meeting minutes are available on-line at the NMISC webpage (<http://ewh.ieee.org/soc/nps/nmisc/>), some of the highlights of the meeting are listed here. As part of the chair's report at the 2009 NMISC meeting, Charles Watson presented a very nice overview



Benjamin M.W. Tsui
*Edward J. Hoffman Medical Imaging
Scientist Award recipient*



Katia Parodi
*Bruce Hasegawa Medical Imaging
Conference Young Investigator
Award recipient*

TECHNICAL COMMITTEES

of the IEEE/NPSS/NMISTC structure: The IEEE is composed of 38 Societies, the NPSS being one of them. The NPSS has several Technical Committees (TC). One of those is the Nuclear Medical and Imaging Sciences TC (NMISTC). The NMISTC is one of the bodies within IEEE responsible for medical imaging activities. It is composed of all IEEE-NPSS members interested in being part of NMISTC. The NMIS Council (NMISC) constitutes the governing body of the NMISTC. The Joint Executive Subcommittee of the NMISC, consisting of the Chair, the Vice-Chair and the Most Recent Past Chair of the NMISC and the corresponding persons from RISC (Radiation Instrumentation Steering Committee), appoint the Chair of the NSS/MIC Oversight Subcommittee (currently this person is Tom Lewellen). The Chairperson of the Oversight Subcommittee appoints the subcommittee's membership. This subcommittee is responsible for the site selection for the future NSS/MIC events and also decides on the General Chair of each NSS/MIC, who then selects the NSS and MIC Program Chairs. The role of the NMISC is to provide oversight and policy guidance.

A much discussed topic was the criteria for accepting abstracts for presentation at the meeting and whether a formal policy/guideline should be adopted. The MIC has traditionally had a higher rejection rate than the NSS meeting. In general it was felt that the review process was fair and of high quality. While some years the rejection rate will need to be a little higher due to site space limitations, it was felt that careful effort should be made to accept as many scientifically qualified papers as possible. There was discussion about reviewing and accepting/rejecting papers on topics not involving nuclear or ionizing imaging techniques. On one hand, it was suggested that we recruit some reviewers with expertise in non-nuclear imaging methods

(e.g., X-ray, optical, MRI, etc.) as there has been an increasing number of papers on multimodality imaging. On the other hand, there was discussion about whether presentations involving only non-nuclear imaging techniques belong at the MIC conference or not.

Another important discussion that directly affects the MIC meeting is whether the MIC should go to parallel oral sessions or not. There are definitely pros and cons to having parallel oral sessions. And while this decision is ultimately up to the MIC Chair and Deputy Chair, these individuals have expressed their desire to receive input from the NMISTC community. If you did not get a chance to express your opinion by filling out a questionnaire at last year's meeting feel free to contact me with your input.

Robert Miyaoka can be reached at the University of Washington, Department of Radiology, Box 357987, Seattle, WA, 98195-7987 USA; Phone: +1 206-543-2084; Fax: +1 206-543-8356; E-mail: rmiyaoka@u.washington.edu.

NMISC AWARD NOMINATIONS SOUGHT

The deadline (July 15, 2010) for new nominations for the 2010 NMISC awards is fast approaching. Consider nominating your well-deserving colleagues for the IEEE NPSS NMISC awards. More details and application forms are available on the NPSS awards website: <http://www.ewh.ieee.org/soc/nps/awards.htm>.

Send your nominations to:

*Anna Celler, PhD
Awards Committee Chair
Medical Imaging Research Group,
Department of Radiology, University
Of British Columbia, Vancouver, Canada
E-mail: aceller@physics.ubc.ca
tel: 604-875-5252.*

We got him!

A country without its czar is like a village without its idiot.

Russian proverb



Anna Celler
NMISC Awards Committee Chair

TECHNICAL COMMITTEES



Edl Schamiloglu
Chair, PPST Technical Committee

PULSED POWER SCIENCE AND TECHNOLOGY TECHNICAL COMMITTEE REPORT

In 2010 the IEEE NPSS through PPST is technically cosponsoring several conferences of interest to the Pulsed Power Science and Technology Community:

- 1) 15th International Symposium on Electromagnetic Launch Technology, May 17-20, 2010, Brussels, Belgium (<http://www.emlsymposium.org/>);
- 2) IEEE International Power Modulator High Voltage Conference, May 23-27, 2010, Atlanta, GA (<http://www.eng.auburn.edu/pmhvc2010/index.html>);
- 3) Megagauss XIII (The 13th International Conference on Megagauss Magnetic Field Generation and Related Topics), July 06-10, 2010, Jiading, Shanghai, China (<http://ifp.caep.ac.cn/mg2010.shtml>);
- 4) BEAMS 2010 (held in conjunction with the 3rd EuroAsian Pulsed Power Conference), October 11-15, 2010, Jeju Island, South Korea (conference website to be linked to this site: <http://www.pulsed-power.org/>).

The 8th Special Issue of the *IEEE Transactions on Plasma Science* devoted to Pulsed Power Science and Technology has received 54 manuscripts. The Guest Editors are Dr. Larry Altgilbers (US Army Space and Missile Defense Command, Huntsville, AL), Prof. Randy Curry (University of Missouri-Columbia), Prof. Weihua Jiang (Nagaoka University of Technology, Japan) and Prof. Paul W. Smith (Fellow of Pembroke College, Oxford, UK). This Special Issue is partly derived from papers presented at the 17th IEEE International Pulsed Power Conference (Washington, DC, June/July 2009) and is scheduled to appear October 2010.

The IEEE NPSS Pulsed Power Science and Technology Technical Committee was formed in January 1995 when the

Pulsed Power Conference became fully sponsored by the IEEE. The current PPST committee membership comprises 24 active members of the pulsed power community. 16 of the members are voting members elected by the committee, and 8 are non-voting Ex Officio members. (See www.ece.unm.edu/ppst for the current composition of the committee.)

With this issue of the Newsletter I am inaugurating a new feature of my committee report—a profile of one of our elected committee members, Dr. Raymond Allen of the Naval Research Laboratory.

Dr. Raymond Allen displayed an early aptitude in math, electronics, and computers. At the age of 17 he joined the Navy and underwent 9 months of training in weapon system electronics. He later became an anti-aircraft gun radar operator aboard the battleship USS Iowa, and participated in Operation Earnest Will. Dr. Allen then attended Old Dominion University in Norfolk, Virginia beginning in 1988 and also continued to serve as a Navy Reservist throughout his undergraduate and graduate education, receiving training in electronics repair, gun maintenance, and law enforcement during this time. In his junior year of the Electrical Engineering program, he developed an affinity toward the field of Pulsed Power when he began working for Dr. Karl Schoenbach as an undergraduate student assistant working primarily in the area of optically controlled semiconductor switching. After obtaining a B.S.E.E degree in 1992, Dr. Allen continued to work as a graduate research assistant, primarily in the area of electron-beam controlled semiconductor switching. After obtaining an M.S.E.E. in 1994, Dr. Allen accepted an offer to continue as a research assistant while pursuing a Ph.D. in Electrical Engineering. His Ph.D. research funded in part by Jefferson Labs (Newport News, VA) primarily involved the use of dielectric

So it is too late!

At first we do not know how to live; and when we do know how it is too late.

Jean-Jacques Rousseau

TECHNICAL COMMITTEES

coatings to prevent breakdown in vacuum, with the goal of preventing breakdowns in the high-voltage injector portion of their particle accelerator. He also researched the source of light emission from the RF windows under high field conditions in their cryogenic RF cavities. Dr. Allen also assisted with one of Dr. Schoenbach's first bioelectric effects experiments involving the treatment of ocean water in pumping systems. (Dr. Schoenbach is now a leader in the area of bioelectric effects of Pulsed Power. He is a recipient of the 2007 IEEE NPSS PPS&T Committee's Peter Haas award.) Dr. Allen received the Outstanding Pulsed Power Student Award at the 11th IEEE International Pulsed Power Conference in 1997.

Dr. Allen was awarded a Ph.D. in 1998 and then spent about one year working for a private research company, FMT, where he investigated secondary electron-emission properties of several materials, including those from a diamond CVD reactor that he constructed. He then spent a year with the Pulsed Power Group at NSWC (Naval Surface Warfare Center), Dahlgren, VA participating in the study of high-power RF effects on military and civilian infrastructure before transitioning to the Naval Research Lab.

Dr. Allen has been working in the Pulsed Power Physics Branch of the Plasma Physics Division of NRL since

April of 2000. He is currently the Senior Engineer in the branch and is primarily responsible for maintaining and diagnosing the electrical performance of branch generators, including the two terawatt-class pulsed-power generators Mercury and Gamble II. Gamble II is a 2-MV, 1-MA generator that has been in service at NRL since the 1970s. Mercury is a much newer, 6-MV, 300-kA generator that has been in operation at NRL since 2004. He also participates in improving the performance of compact MV radiography sources, the design and testing of railgun power supplies, the design of circuits for active detection of special nuclear materials, as well as electrical analysis of several pulsed power machines outside of NRL.

Dr. Allen has served on the IEEE Pulsed Power Science and Technology Committee (PPS&T) since June 2006. His dedication to Pulsed Power is evident, as he developed and maintains the "Pulsed Power Portal" web site at www.pulsedpower.net with several applets and information pages related to the field of Pulsed Power.

Edl Schamiloglu, Chair of the Pulsed Power Science and Technology Technical Committee, can be reached at the Department of Electrical Engineering and Computer Science, MSC01 11001, University of New Mexico, Phone: +1 505 277 4423; Fax: +1 505 277-1439; E-mail: edl@ece.unm.edu.

Gardez-vous

The human race's prospects of survival were considerably better when we were defenceless against tigers than they are today when we are defenceless against ourselves.

Arnold Toynbee

TECHNICAL COMMITTEES

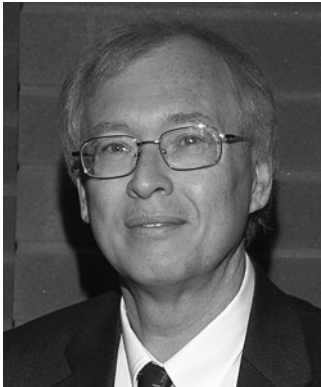


Pascale Gouker

RADIATION EFFECTS NEWS

Member-at-Large Elected

Pascale Gouker (S'88, M'92—IEEE membership) received her Diplôme d'Ingénieur (M.S.) in Physics, her Diplôme d'Etudes Approfondies and her Doctorat (Ph. D.) in Microelectronics from the National Institute of Applied Sciences (INSA) in Toulouse in 1992. She performed her Ph.D. dissertation research at the Georgia Tech Research Institute, Georgia Institute of Technology, in Atlanta Georgia studying impact ionization effects in multiple quantum well avalanche photodiodes. She is a Member of the Technical Staff in the Advanced Silicon Technology Group at MIT Lincoln Laboratory. Her projects and research interests include: Development of fabrication modules for fully depleted silicon-on-insulator CMOS technology for extreme environment operation; Characterization and modeling of radiation effects in nanoelectronic technologies; Design and characterization of advanced FDSOI CMOS circuits; 3D integrated and focal plane readout circuits for extreme environments. Prior to joining Lincoln Lab in 1999, she worked on III-V material growth, light detector, solar cell and transistor design, fabrication and characterization. She has authored or coauthored over 40 papers in the semiconductor electronics field on both III-V compound semiconductors and silicon. She has been a technical reviewer for the IEEE Nuclear and Space Radiation Effects Conference (NSREC), the *IEEE Transactions on Nuclear Science*, and the Hardened Electronic and Radiation Technology Conference. Last year, she was also a member of the NSREC Awards Committee.



Daniel M. Fleetwood
NSREC Chair



Teresa Farris
RE Publicity Chair

Outstanding Papers at the 2009 Nuclear and Space Radiation Effects Conference

2009 NSREC Outstanding Conference Paper Award:

"Single-Event Upsets and Multiple-Bit Upsets on a 45 nm SOI SRAM," *D. F. Heidel, P. W. Marshall, J. A. Pellish, K. P. Rodbell, K. A. LaBel, J. R. Schwank, S. E. Rauch, M. Hakey, M. D. Berg, C. Castaneda, P. E. Dodd, M. R. Friendlich, A. D. Phan, C. M. Seidleck, M. R. Shaneyfelt and M. A. Xapsos*

2009 Outstanding Student Paper Award:

"Error Instability in Floating Gate Flash Memories Exposed to TID," *M. Bagatin, S. Gerardin, G. Cellere, A. Paccagnella, A. Visconti, M. Bonanomi, and S. Beltrami*

2009 Outstanding Data Workshop Presentation Award:

"Single Event Effects Compendium of Candidate Spacecraft Electronics for NASA," *M. V. O'Bryan, K. A. LaBel, S. P. Buchner, R. L. Ladbury, T. R. Oldham, H. S. Kim, M. J. Campola, J.-M. Lauenstein, D. Chen, M. D. Berg, A. B. Sanders, J. A. Pellish, P. W. Marshall, C. J. Marshall, M. A. Xapsos, K. Kruckmeyer, M. Leftwich, M. Leftwich, and J. M. Benedetto*

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

AWARDS COMMITTEE

Nominate a Colleague for a Technical Committee Award

All of the NPSS Technical Committees give awards each year to people who have made outstanding contributions in the relevant technical areas. Please consider nominating a mentor, a colleague, or a student for one of these awards—surely you know somebody who deserves one!

More information on these and other relevant Awards, including description of the award, submission forms, and submission deadline, is available in the Technical Committee Awards section of the NPSS Awards web site, <http://ewh.ieee.org/soc/nps/awards.htm>.

New Fellows

The IEEE offers Institute Awards, and most societies and Society Technical Committees offer awards. However, elevation to IEEE Fellow is a prestigious honor awarded each year to no more than 0.1% of the full IEEE membership by the Institute Board of Directors. Nominations are made from among Senior Members and nominees must be supported by at least six Fellows. After vigorous review and ranking by the Fellow Evaluation Committee, comprised entirely of Fellows of the appropriate IEEE Society, the nominations are forwarded to the Institute's Fellow Committee who then recommend a list of candidates to the IEEE Board of Directors for their consideration. The Nuclear and Plasma Sciences Society is justifiably proud of its Fellows. We present here the Class of 2010 Fellows, all members of our Society, but not all elevated through our Society, and wish them each our heartfelt congratulations.

JOHN EDWARD ALLEN

J.E. Allen was educated at Liverpool University where he studied Electrical Engineering in the immediate post-war years. He stayed on to work for a Ph.D. doing experimental work with high current spark discharges. These involved currents up to 265 kA which were the highest currents produced in any laboratory at that time.

In 1952 he went to join P.C. Thonemann who had just moved the Controlled Thermonuclear Reaction (Fusion) project to Harwell, after preliminary work at the Clarendon Laboratory, Oxford. At Harwell, Allen carried out both experimental and theoretical work on various aspects of Plasma Physics. The work included Langmuir probes, the A.B.R. (Allen-Boyd-Reynolds) theory being much used thereafter. Another important contribution was the discovery of solitary waves in Plasma Physics, the Adlam-Allen wave (1958). In the literature the credit is normally given to Zabusky and Kruskal (1965) who studied the nonlinear interaction of such waves and coined the term “soliton.”

In 1958 John Allen was invited by Amaldi to start a Plasma Group in Rome. This group started in the University of Rome (La Sapienza) and later moved to Frascati. He stayed for six years to build up, with B. Brunelli, the Laboratorio Gas Ionizzati. During this time a post-graduate course was run in Rome, students worked on their final year theses and some undergraduate projects were carried out. Allen had the courtesy title of Professor; only Italian nationals could hold an established Chair at that time.

In 1964 John Allen went to Cambridge, on the invitation of W.R. Hawthorne (later Master of Churchill College). In 1965, however, he moved to Oxford because there was a greater interest there in Plasma Physics at that time. This

(continued on page 28)



Bill Moses
Awards Chair



John Edward Allen

FUNCTIONAL COMMITTEES

Physics 1, Politics 0

Kirchoff's law, not federal law, governs [electric] power flow.

Clark W. Gelling and Kurt E. Yeager

(continued from page 27)

was partly due to the presence of nearby Government Establishments, Culham in particular.

At Oxford John Allen has carried out a broad program of research in plasmas (mostly of a non-fusion kind). This has been largely basic in nature, but also directed towards plasma processing. The latter is of great importance in the microelectronics industry. Experiment and theory have been closely combined in all of this work. Since 1965 the program has included, inter alia, current limitation in low pressure plasmas, further work on Langmuir probes and boundary phenomena, thermally produced alkali plasma, plasma dynamics including ion rarefaction waves, optically pumped plasmas, magnetohydrodynamics of liquid metals and radio-frequency plasmas for plasma etching.

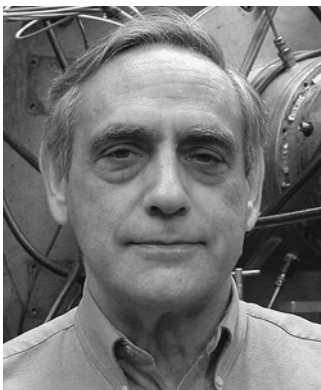
His recent researches have been mostly on dusty plasmas. These include the formation of dust vortices, the fracture

of self-organized assemblies of dust particles (known as a "plasma crystals") using a low-power laser beam, and the measurement of the dust charge by two different methods. Theoretical work has also been carried out, mainly dealing with the limited validity of the much-employed Orbital Motion Limited (OML) theory of particle charging.

His present work is a theoretical study of dust particles in tokamaks. This is being carried out in collaboration with Dr. Michael Coppins and his group at Imperial College, London, where Allen has been a Visiting Professor in Physics since 2004.

Citation: "for contributions to high current and radio frequency discharges, sheath and wave phenomena, and electronegative and dusty plasmas."

Professor John Allen can be reached at the Department of Engineering Science, University of Oxford, Parks Road, Oxford OX1 3PJ, UK; E-mail: allenj@maths.ox.ac.uk.



Robert J. Commisso

ROBERT J. COMMISSO

Robert J. Commisso received a B.S. degree in physics from the Lowell Technological Institute (now the University of Massachusetts at Lowell), Lowell, MA, in 1968 and the Ph.D. degree in physics from the University of Maryland, College Park, in 1976, where he studied plasma physics. From 1976 to 1980, he was a Staff Member at the Los Alamos National Laboratory, Los Alamos, NM, where he worked on controlled fusion research. In 1980, he joined JAYCOR as a Senior Research Scientist, developing novel opening switch concepts at the Naval Research Laboratory (NRL), Washington, DC. He joined NRL as Head of the Pulsed-Power Staff in the Plasma Technology Branch in 1983. He is currently Head of the Senior Staff in the Pulsed Power

Physics Branch and is a Principal Investigator for programs in pulsed power, radiation source development, and active detection of fissile material. He also serves as a technical advisor to DTRA in the areas of pulsed power and radiation source development. His research interests include high-power electron and ion beams, high-atomic-number Z-pinch, and plasma opening switches. Applications of this research include photon- and neutron-induced fission for detection of fissile material, simulation of X-ray induced nuclear weapon effects, high-power flash radiography, and the development of advanced pulsed-power systems.

Dr. Commisso has an exceptional record of achievement over more than three decades in a broad range of

FUNCTIONAL COMMITTEES

activities associated with the physics and technology of high-voltage pulsed-power systems, high-current pulsed plasmas, radiation sources, and opening switches. He was responsible for the design, construction, and operation of three major TW-level pulsed-power facilities at the Naval Research Laboratory (NRL). The 3-MA Pawn inductive-storage generator utilized an air-insulated capacitor bank, a multiwire fuse, and a long-conduction-time plasma-opening switch (POS) for compact inductive-storage research. The Hawk inductive generator uses an 800-kA Marx coupled to a Plasma Opening Switch (POS) to drive electron-beam diodes and z-pinches. Mercury, a new 6-MV, 360-kA inductive voltage adder, has demonstrated higher resolution, negative-polarity pulsed X-ray sources than have been previously available for Stockpile-Stewardship X-ray-radiography applications. In positive polarity, ion beam interactions with targets are applied to detecting fissile materials, an important national objective.

Dr. Commisso's contributions in pulsed plasmas started with his pioneering work on theta pinches and their application to magnetic confinement fusion, making seminal contributions to the understanding of the dynamics and turbulent nature of electron and ion heating. More recently he has made seminal contributions to the understanding of multi-megampere z-pinch energetics. His technical coordination and critical contributions to a large multilaboratory research effort have resulted in record advances in the production of 3-10-keV cold x rays from z-pinches on the DECADE Quad and Saturn generator at Sandia National Laboratory for nuclear weapon effects simulation (NWES). Dr. Commisso also led an effort to characterize and optimize the radiographic properties of the vacuum-rod-pinch diode at 1-2 MeV which led to its utilization in the Armando sub-critical experiment.

The results of a collaboration he led with the French resulted in the rod pinch becoming a new focus for radiography programs in the US, France and the UK.

He currently leads a multilaboratory effort that has resulted in improved understanding and performance of the reflex triode for efficient production of 10-100-keV X rays on the SNL Saturn generator for important NWES applications. Dr. Commisso also leads a unique effort at NRL to use TW pulsed power to actively detect fissile materials using > 100 kA pulsed proton beams to generate 6-7-MeV characteristic X-rays for inducing photo fission.

Dr. Commisso is highly recognized for his work on opening switches, which includes electron-beam controlled switches and the long- and short-conduction-time POS. The POS has led to major improvements in existing pulsed-power systems and promise compact, transportable systems in the future for a number of important applications. He has been a leading force in the development of the plasma opening switch (POS) for power amplification in TW generators. He co-authored the first US paper on the short-conduction-time (~100-ns) POS in the early 1980s where pulse compression with voltage and power gain was demonstrated. He initiated an innovative implementation of magnetic probe arrays in the POS plasma to measure the important physics aspect of current penetration. Dr. Commisso was the lead author of a book chapter on the physics and applications of the short-conduction POS, spurring international interest in inertial-confinement fusion and NWES applications. He then led a very successful effort to develop the long-conduction-time (~1000-ns) POS, where the magnetic field significantly distorts the plasma. Dr. Commisso participated in the first US 500-ns conduction time experiments demonstrating voltage gain. He then carried out experiments on Pawn

(continued on page 30)

The road not taken

Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius—and a lot of courage—to move in the opposite direction.

E.F. Schumacher

FUNCTIONAL COMMITTEES

Apocrypha

*I had a great idea this morning but
I didn't like it.*

Samuel Goldwyn

(continued from page 29)

demonstrating conduction for 900-ns to 1-MA peak current with fast opening and voltage gain. Under his direction, the work on Pawn moved to Hawk, where advanced diagnostic techniques, as well as MHD and PIC codes, were used to better understand the physics at the ~1000-ns, ~1-MA level and its relation to the short-conduction POS physics. Hawk results played a critical role in the successful operation of DECADE, the first TW-class NWES generator where inductive-storage techniques played a critical role. He has given invited talks at international conferences and workshops on POS physics and collaborates with colleagues in Israel and Russia. Commisso's POS research has led to major improvements in existing pulsed-power facilities and promises lower cost, compact, transportable capabilities in the future for a number of important applications including NWES, pulsed radiography, and detecting fissile materials.

Dr. Commisso's technical achievements are evidence by his authorship or co-authorship of over 175 papers in refereed journals and conference proceedings.

He has been very actively involved with IEEE activities since 1986, including chairing the 2004 IEEE International Conference on Plasma Science, being a Senior Editor of the *IEEE Transactions on Plasma Science* (for Charged Particle Beams and Sources), and being elected to five 3-year terms on the Executive Committee of the Nuclear and Plasma Science Society's Plasma Science and Applications Committee.

Citation: "For contributions to the physics, technology, and applications of high-voltage pulsed-power systems, high-current pulsed plasmas, and opening switches."

Bob Commisso can be reached at the Naval Research Laboratory, Pulsed Power Physics Branch, Code 6770, 4555 Overlook Ave SW, Washington DC 20375-5320; e-mail: Robert.commisso@nrl.navy.mil.



Christine A. Coverdale

CHRISTINE A. COVERDALE

Christine A. Coverdale of Sandia National Laboratories was recently elevated to Fellow status by IEEE. Her work in the development of neutron sources was key to her elevation.

The neutron source development work was performed at the Z Accelerator at Sandia National Laboratories, with theoretical and computational support from the Plasma Physics Division at the Naval Research Lab as well as Imperial College and Sandia National Laboratories. The experiments demonstrated that significant quantities of neutrons ($>10^{13}$) could be produced from imploding deuterium gas puffs in a z-pinch configuration. [*C.A. Coverdale*

et al., Phys. Plasmas 14, 056309 (2007), C.A. Coverdale et al., Phys. Plasmas 14, 022706 (2007), A.L. Velikovich et al., Phys. Plasmas 14, 022701 (2007)] The deuterium gas puffs utilized a structured, large diameter nozzle used previously for other X-ray source development work. To evaluate the imploding plasma, low level dopants were used in the deuterium gas that could be tracked with standard X-ray diagnostics such as spectroscopy and radiated output. These additional data allowed for careful comparison of many measured plasma parameters with computer simulations. The high level of neutron output measured was a significant enhancement over previous experiments, and the agreement between

FUNCTIONAL COMMITTEES

the experimental measurements and calculated values suggested a significant fraction of the neutron emission was thermonuclear.

The work in developing neutron sources is only one aspect of Dr. Coverdale's research over the last several years. She received a B.S. degree in physics and mathematics from the University of Puget Sound in Tacoma, WA, in 1988, a M.S. degree in 1989, and a Ph.D. degree in 1995, both from the University of California, Davis, in plasma physics. She joined Sandia National Labs in 1997, where her research has encompassed z-pinch plasmas, as well as radiation effects work and diagnostic development. She has led numerous z-pinch based X-ray source development experiments, including long implosion time wire array Z-pinches, high photon energy Z-pinch sources, and the aforementioned deuterium gas puffs for neutron production. Dr. Coverdale's work with neutron sources won best paper at the Hardened Electronics and Radiation Technology Conference in 2006. The z-pinch experiments, and her collaborations outside Sandia with the Naval Research Lab and the University of Nevada, Reno, have led to many invited presentations and over 80 peer-reviewed papers as an author or co-author.

Dr. Coverdale has been actively involved in the scientific community the last several years as well. She has served as Member-at-Large for the Hardened Electronics and Radiation Technology (HEART) Steering Committee and is currently the Publications Chair on the HEART Steering Committee. She was the Technical Program Chair for HEART 2009 and will be the HEART Conference Chair in 2012. She has also served on several committees for the American Physical Society Division of Plasma Physics and is a Fellow of the American Physical Society.

Within IEEE, Dr. Coverdale has served three terms on the Executive Committee of the IEEE Plasma Science and Applications Committee. She is currently the Technical Program Chair for ICOPS 2010, a role in which she also served for ICOPS 2009, and serves as the Senior Editor for High Energy Density Physics for *IEEE Transactions on Plasma Science*.

Citation: "For contributions to the development of neutron sources."

Christine Coverdale can be reached at Sandia National Laboratories, P.O. Box 5800, MS-0671, Albuquerque, NM 87185-0671; Phone: +1 505 845-8340; E-mail: cacover@sandia.gov.

MICHEL DEFRISE

Michel Defrise received the Ph.D. degree in physics from the University of Brussels (Vrije Universiteit Brussel) in 1981. He has since been working as a research scientist in that University and is currently professor in the Department of Nuclear Medicine. After his Ph.D., which was devoted to theoretical high energy physics, he switched to the study of inverse problems in imaging, working on the development of three-dimensional reconstruction algorithms for the HIDAC positron camera based on multiwire proportional chambers,

which had been developed at CERN by Alan Jeavons and David Townsend. He then worked with David Townsend and Rolf Clackdoyle on image reconstruction for the first three-dimensional acquisitions with multiring PET scanners operated without interslice septa, soon leading to the generalization of 3D data acquisition in PET. This fruitful collaboration continued during a sabbatical as visiting professor in the Department of Radiology of the University of Geneva in 1992-1993, where he contributed to the

(continued on page 32)

Not in DSM IV

A neurosis is a secret you don't know you are keeping.

Kenneth Tynan



Michel Defrise

FUNCTIONAL COMMITTEES

Vive la difference

Why do you have to be a nonconformist like everybody else?

Stan Hunt

(continued from page 31)

clarification of several mathematical and algorithmic problems of PET. In 1994 Defrise invented the Fourier rebinning algorithm, which was later applied in most commercial clinical scanners to accelerate the computationally intensive image reconstruction in 3D PET. At the same time he started investigating image reconstruction for 3D cone-beam tomography with applications in CT and in single-photon emission tomography (SPECT) with convergent or pinhole collimators. He derived in collaboration with Rolf Clackdoyle (U. of Utah, now at the CNRS) the first exact algorithm of the filtered-backprojection type for this problem; this was followed by several breakthroughs in cone-beam tomography in joint work with Frédéric Noo (U. of Liège, now at University of Utah) and Hiroyuki Kudo (Tsukuba University). In recent years his work in tomography

has focused on the application of pinhole micro-SPECT to molecular imaging, on time-of-flight PET and on the reconstruction from incomplete tomographic data, a theme that has known a remarkable revival since 2001.

Michel Defrise was effective in the organization of several international meetings. He initiated in 1991 in Belgium with David Townsend the series of biennial International Conferences on Fully Three-Dimensional Image Reconstruction, which produced in its ten venues key contributions to recent achievements in tomography. He also acted as co-chair of the 2004 IEEE Medical Imaging Conference. Michel Defrise is Associate Editor of the IEEE Transactions on Nuclear Science and Fellow of the Institute of Physics (UK).

Citation: For contributions to tomography.

Michel Defrise can be reached by E-mail at mdefrise@vub.ac.be.



Paul E. Dodd

PAUL E. DODD

Paul E. Dodd is a Principal Member of the Technical Staff and acts as Team Leader for Radiation Physics, Technology, and Assurance, at Sandia National Laboratories in Albuquerque, New Mexico. Paul received his B.S., M.S., and Ph.D. degrees in Electrical Engineering from Purdue University in 1988, 1989, and 1993, respectively. Following the completion of his graduate studies, he joined Sandia National Laboratories. Over the past 16 years, he has been involved in the development of Sandia's radiation-hardened bulk and silicon-on-insulator CMOS technologies, the investigation of physical mechanisms responsible for device radiation response, and the computer simulation of radiation effects on microelectronics. During this time he has also performed extensive radiation hardness assurance testing of a variety of microelectronic devices and integrated circuits, with an emphasis on

the testing and analysis of single-event effects. His work has led to an improved understanding of physical mechanisms for single-event effects and has been critical to the success of several space and military systems that must operate reliably in radiation environments.

Paul is very active in the radiation effects and microelectronics research communities, having served on committees for the IEEE Nuclear and Space Radiation Effects Conference (NSREC), the IEEE International Electron Devices Meeting, and the IEEE International Reliability Physics Symposium (IRPS). Paul has been General Chairman, Technical Program Chairman, Short Course Chairman, Awards Chairman, and Publicity Chairman for the IEEE NSREC. He has presented numerous short courses at the NSREC, the IRPS, the IEEE Silicon-on-Insulator Conference, the Hardened

FUNCTIONAL COMMITTEES

Electronics and Radiation Technology Conference, and the European RADECS conference.

Paul has authored or co-authored over 100 publications, including papers that have won 9 Outstanding Conference Paper awards at the IEEE NSREC. In 2001, Paul received the IEEE NPSS

Early Achievement Award and was named Outstanding Young Engineer by the IEEE's Albuquerque Section.

Citation: For contributions to the understanding and simulation of single-event effects in microelectronics.

Paul Dodd can be reached by E-mail at pedodd@sandia.gov.

GEORGE C. GIAKOS

George Giakos is a professor in the Department of Electrical and Computer Engineering, and Biomedical Engineering, at the University of Akron, OH, USA. In addition, he is the Director of Imaging and Surveillance Technologies, and Molecular Nanophotonics Laboratories.

Prior joining the University of Akron, he has been an Associate Director of the Imaging Research Laboratory at the University of Tennessee, in the Department of Biomedical Engineering. In 1978, he received the Laurea Degree in Physics from the University of Turin, Italy, a graduate Degree in Nuclear Instrumentation from the University of Edinburgh, UK, (1979), a MS Degree in Nuclear Space Physics from Ohio University, US (1985), and a Ph.D. Degree in Electrical and Computer Engineering from Marquette University, US (1991). Dr. Giakos' research focuses on the design of imaging systems, ladars and surveillance sensor platforms, multispectral polarimetry, nuclear instrumentation, design of cargo and airport security inspection systems for the Department of Defense and Homeland Security, as well as in the design of innovative molecular nanophotonics devices. His research group was among the first in the US to pioneer the characterization of the detection and imaging characteristics of cadmium zinc telluride semiconductor substrates for flat-panel digital radiography applications.

George Giakos invented the multiatomic-number, multidensity, digital radiographic imaging detectors operating on hybrid detection principles. This class of highly tunable and reconfigurable digital detectors operates under dual-energy detection principles and consists of two detector volumes of different material composition and atomic number. The front detector element absorbs and amplifies internally most of the low energy photons through avalanche-photoelectric conversion, while the rear detector absorbs most of the high energy photons, while providing high contrast, high specificity, and spatial resolution images, with high scatter rejection and specificity. In addition, he introduced novel active optical multispectral multifusion polarimetric detection principles using lasers or narrow beam infrared LEDs in conjunction with multimodality imaging modalities, to illuminate scenes at specific wavelengths and interrogate their respective reflectance spectral difference features. Further contrast enhancement of the target-to-background ratio can be obtained by doping the background surrounding the target with high-index-of-refraction molecules, polar molecules and dedicated nanostructures providing enhanced differential imaging information and distinct signatures related to the target material composition, morphological, physiological, chemical, biochemical, and metabolic information.



George C. Giakos

(continued on page 34)

FUNCTIONAL COMMITTEES

One-sided view

Earnest people are often people who habitually look on the serious side of things that have no serious side.

Van Wyck Brooks

(continued from page 33)

Dr. Giakos, has fostered several breakthrough inventions which have been rewarded with fifteen (15) US and international Patent Awards and more than 150 peer-review articles and journal publications. He is the recipient of a Distinguished Faculty Fellow Award, from the Office of Naval Research. He has received numerous prestigious research faculty fellowship awards from the Department of the Air Force, NASA, National Academy of Sciences, and Naval Research Laboratory.

Dr. Giakos is an IEEE Fellow, the Editor in Chief of the *International Journal of Signal and Imaging Systems Engineering (IJSISE)*, the Chairman of the TC-19 IEEE Technical Committee on "Imaging Measurements," for the Instrumentation and Measurements Society, a Guest Editor of the Special Issue on Imaging Systems and Techniques in the *IEEE Transactions on Instrumentation and Measurement*, 1996, a Guest Editor of the Special Issue on Imaging Systems and Techniques in the *IEEE Transactions on Instrumentation and Measurement*, 2006,

a Guest Editor for the Special Issue on Imaging Systems and Techniques in the *Measurement Science and Technology Journal*, 2008, a Guest Editor of the Special Issue on Imaging System and Techniques, *IET Image Processing Journal*, IOP, 2009. He is a member of the IEEE Instrumentation and Measurement Society, IEEE Nuclear and Plasma Sciences Society, IEEE Photonics Society, IEEE Nanotechnology Forum, and SPIE. He maintains active collaborations with the Department of Navy, Department of the Air Force, Lockheed Martin, NASA, NIH, and Cleveland Clinic. He is the founder, organizer and general chairman of the successful IEEE IM International Workshops and Conferences on Imaging Systems and Techniques.

Citation: for contributions to efficient imaging devices, systems and techniques

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Patrick M. Lenahan

PATRICK M. LENAHAN

Patrick Lenahan earned his Ph.D. from the University of Illinois, Champaign-Urbana, Illinois, USA in 1979 and then briefly served as a post-doctoral fellow at Princeton University, Princeton, New Jersey, USA. Starting in 1980 he spent five years at Sandia National Laboratories, Albuquerque, New Mexico, USA. Since 1985 he has been at Pennsylvania State University, University Park, PA, USA, where he is Distinguished Professor of Engineering Science and Mechanics. In 2001, he served as Visiting Professor of Electronic and Computer Engineering at Nihon University, Tokyo, Japan. From 2000 to 2004 he was associate editor of *The Journal of Electronic Materials*. Dr. Lenahan has served on the organizing committees of electrical engineering,

materials science, applied physics, and analytical chemistry conferences including the IEEE IIRW, the IEEE Nuclear and Space Radiation Effects Conference, the IEEE Semiconductor Interface Specialists Conference, the TMS Electronic Materials Conference, and the Electron Paramagnetic Resonance Symposium of the Rocky Mountain Conference on Analytical Chemistry. He was technical program chairman and general program chairman of the IEEE International Integrated Reliability Workshop (IIRW) in 2007 and 2008, respectively.

In collaboration with many co-workers, Dr. Lenahan has contributed to the development of the electronic materials science of semiconductor devices. His primary contributions have been

FUNCTIONAL COMMITTEES

in two areas. (1) The development of a fundamental understanding of the point defects which limit the performance of semiconductor devices, particularly with respect to radiation and other reliability problems in conventional MOS devices, and performance limiting trapping centers in high dielectric constant MOS devices, silicon carbide transistors, and silicon nitride based thin film transistors. (2) The development and adaptation of magnetic resonance techniques to achieve the requisite combination of high sensitivity and analytical power needed to study materials physics problems in meaningful device structures.

Lenahan and co-workers identified the physical and chemical nature of point defects which dominate radiation damage, the negative bias temperature instability, stress-induced leakage currents, and hot carrier phenomena in conventional MOS devices. They have also identified performance limiting trapping centers in other systems including dominating traps in silicon nitrides of amorphous silicon/silicon nitride thin film transistors, electron traps in hafnium oxide based gate stacks of high-k MOS devices, and several traps limiting the performance of silicon carbide based transistors.

Dr. Lenahan and co-workers have also determined energy levels of some of these trapping centers. A major aspect of this work has been the pioneering use and development of very sensitive electrically detected magnetic resonance (EDMR) techniques in the study of semiconductor device materials physics problems. EDMR has allowed the analytical power of magnetic resonance to be applied to small numbers of performance limiting defects in fully processed devices with quite small geometries, for example, to identify defects involved in low voltage stress-induced leakage currents in MOS devices with 1.2 nm EOT gate dielectrics.

Dr. Lenahan has authored or co-authored 130 refereed journal articles; they have been cited more than 3500 times in the scientific and technical literature.

Citation: "For contributions to understanding of radiation damage and reliability of metal oxide semiconductor devices."

Patrick Lenahan can be reached at Pennsylvania State University, Department of Engineering Science and Mechanics, 212 EES Bldg. PSU University Park, PA, 16802; phone: 814-863-4630; fax: 814-865-9974; E-mail: pmlesm@enr.psu.edu.

HILLARD CRAIG MILLER

H. Craig Miller, called Craig, was born in Northampton, Pennsylvania in 1932. He attended Lehigh University where he received the B.A. degree in Physics in 1954 and the M.S. degree in Physics in 1955, and Pennsylvania State University where he received the Ph.D. in Physics in 1960. Dr. Miller worked for the General Electric Company for 32 years, retiring in 1993, and also taught evening classes in Physics at St. Petersburg Junior College from 1974 to 1990.

Dr. Miller's most important scientific contribution to the field of discharges and

electrical insulation in vacuum was the first accurate measurement of the degree of ionization and energy of ions emitted from the cathode spot of the vacuum arc. "...Miller's measurements became the benchmark against which all subsequent ion energy measurements were compared, and his papers on the topic are probably the most cited references on vacuum arcs. His work stimulated extensive further investigations into the nature of the cathode spot whose objective was to explain the origin of these high energy ions.

(continued on page 36)

Cave Americanum

There are few forces more ruthless than Americans doing good.

John. W. Holmes



Hillard Craig Miller

FUNCTIONAL COMMITTEES

So be happy!

Life is hard because it can only get better. If it were easy, it would only get worse!

Ray Glenister

(continued from page 35)

Miller also contributed to the area of surface flashover, and investigated a number of surface treatments and their effect on flashover. In addition to his original experimental investigations, Dr. Miller wrote a series of reviews of anode phenomena, which established a uniform vocabulary and nomenclature in this field, and have unified diverse and seemingly contradictory observations into a sensible framework.

Miller further served the discharge and electrical insulation in vacuum community by compiling an extensive bibliography on vacuum breakdown and vacuum arcs, which served as a basic research tool for a generation of investigators.”

Craig Miller received the Dyke Award from the International Symposia on Discharges and Electrical Insulation in Vacuum (ISDEIV) in 1996. The statements within the “...” are taken from the text of this award.

He is a member of the Permanent International Scientific Committee (PISC), which is the governing board for the ISDEIV. He served as treasurer of the PISC for twenty years.

Citation: “for research on discharges and electrical insulation in vacuum.”

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Thomas Roser

THOMAS ROSER

Thomas Roser earned a Ph.D. in physics from the Swiss Federal Institute of Technology in Zurich in 1984. He became a research fellow at the University of Michigan in the same year and was appointed assistant professor of physics at the university in 1990. In 1991, he joined Brookhaven National Laboratory where he led the commissioning of the Relativistic Heavy Ion Collider (RHIC) and the development of polarized proton acceleration, that resulted in the first 250 GeV polarized proton collisions in RHIC. He presently serves as Chair of the Collider-Accelerator Department (C-AD) at BNL. He is also a Fellow of APS and AAAS and a recipient of the IEEE/NPSS Particle Accelerator Science and Technology Award.

The development of RHIC as the world's only polarized proton collider is Dr. Roser's significant achievement. The Relativistic Heavy Ion Collider, (RHIC), is a machine that enables us to learn fundamental properties of the universe, such as the stunning discovery that the universe was a perfect fluid in its first microseconds after the “Big-Bang” and

enables scientists to study the mystery of where does the spin of the nucleus reside. The collision of highly polarized high-energy proton beams offers the unique possibility to explore directly the contribution of gluons to the spin of the proton.

Dr. Roser proposed and developed a partial Siberian snake for the Brookhaven Alternating Gradient Synchrotron (AGS) that made the reliable acceleration of highly polarized proton beams possible. The initial design of the partial snake was solenoidal, which he later replaced with two compact helical dipole magnet designs. With this design a record beam polarization of 65% at 25 GeV was achieved.

Dr. Roser then led the preparation and commissioning of the Brookhaven Relativistic Heavy Ion Collider (RHIC) as the world's first and only polarized proton high-energy collider achieving collisions of 100 GeV on 100 GeV proton beams with a beam polarization of up to 60 %. The collision of highly polarized highenergy proton beams offers the unique possibility to explore directly

FUNCTIONAL COMMITTEES

the contribution of gluons to the spin of the proton. The primary function of RHIC is the collision of high energy heavy ion beams and Dr. Roser was responsible for the rapid commissioning of the world's first heavy ion collider that exceeded design luminosity quickly and provided record luminosities for gold-gold collisions, copper-copper collisions, and asymmetric deuteron-gold collisions.

Citation: “for contributions to the design of magnets in particle accelerator applications.”

Thomas Roser can be reached at the Collider-Accelerator Department, Building 911B, Brookhaven National Laboratory, Upton, NY 11973-5000; E-mail: roser@bnl.gov.

GEORGE ZENTAI

George Zentai is Research and Development Program Manager of Digital X-ray Imagers and is a known expert in the field of digital X-ray imaging. He has numerous patents and publications, and reviews papers on this topic. He has developed several new X-ray imagers. His latest inventions improve X-ray imaging by retaining high quality X-ray images but with a fraction of the prior dose by introducing the next generation of photoconductor imagers. These keep the high spatial resolution of a-Se X-ray imagers but require much lower bias voltages while providing sensitivities of about 8 times that of a-Se. The dose is a major concern in fluoroscopy, mammatomography and CT (X-ray Computed Tomography, which generates 3D X-ray imaging of the body) and for the small experimental animals used in cancer research. He recently demonstrated that thicker layer photoconductor imagers can also be used for high energy X-ray radiation therapy (portal) imaging applications for better targeting of only the cancer lesion and sparing of adjacent healthy tissues and universal diagnostic-oncology X-ray imagers can be developed that retain high resolution even at megavoltage X-ray energies.

Dr. Zentai joined the Technology Center in 1998 and has been a key technical program and project leader. From 1999 to date, Dr. Zentai has been key in

receiving funding for eight externally supported programs on digital X-ray imagers, totaling over \$20 million with partners, that include Xerox PARC, Hebrew University, RTR—a small Jerusalem startup, the University of Toronto, Radiation Monitoring Devices, and Constellation Technologies. From numerous personal contributions and skillfully leveraging of these resources, he has become an internationally recognized expert in this potential breakthrough field.

Dr. Zentai was a team leader in the Varian project that developed a patented new Application Specific Integrated Circuit (ASIC) for readout, which increased the dynamic range from 14 bits to over 16 bits. This wide dynamic range is very important for CT applications where the signal varies several orders of magnitude depending on the patient's size, weight and bone structure.

Homeland Security projects led to a very rugged portable X-ray imager for use by the US Navy and other US military units. This provides instant X-ray imaging for onsite viewing and transmission of images anywhere in the world with the use of a laptop computer, a hand-held X-ray source and an international digital communications link. Used for medical or inspection/security images, the portable imager digitally transfers images to medical or intelligence centers worldwide.

(continued on page 38)



George Zentai

Frozen smile too?

*...from whom I got a very chilly nod
and the sort of greeting a corpse
would give to an undertaker.*

Stanley Baldwin

(continued from page 37)

He also conceived, developed and patented a system adapting X-ray imaging to testing of the interconnection integrity of printed circuit boards (PCBs) that uses an electrostatic imaging technique to evaluate simultaneously and in a few steps, large portions of PCBs so individual probe tests are unnecessary. The PCBs are laid onto the TFT array. By pulsing the traces individually, the induced electrostatic images show where the traces are connected, and where continuity problems are located. This simplifies the TFT-array-pixel-addressing and permits the electrostatic imaging to be software controlled. The system can replace the traditional “flying probe” PCB testers and provide much faster and more reliable evaluations by eliminating moving parts.

Dr. Zentai has worked at the forefront of science for over 35 years. In Hungary he worked at the Central Research Institute for Physics of the Hungarian Academy of Sciences. He became project leader for amorphous semiconductor research. With others he developed a nonvolatile memory

device based on chalcogenide materials. He also worked on material-laser interactions, studying optical memory effects. Since that time, applications of this early research have led to flash memory devices and to other storage applications for DVD-RW discs.

More than a theoretician, Dr. Zentai focuses on and provides real world and hands-on applications of theory. He designed and built several of the scientific-measuring-and-test systems at the Central Research Institute for Physics. He has developed a family of high power Argon and Krypton gas lasers that have gone into commercial production and are currently being used in Hungary for both medical and entertainment applications.

Before joining Varian, he worked on large area X-ray imagers at Argonne National Laboratory as an invited scientist. Later he became program manager of X-ray imagers at Optical Imaging System. Since 1998 he has worked in the Ginzton Technology Center of Varian Medical Systems, which is the major innovations resource of the company.

IEEE 2010 Healthcare Technology Medalists Announced

Dr. Ronald Nutt and Dr. David Townsend were recently named as the co-recipients of the IEEE 2010 Healthcare Technology Medal, one of the highest awards within IEEE, which is given to individuals or a team for outstanding contributions and/or innovations in engineering within the fields of medicine, biology, and healthcare technology. The citation reads, “For the invention, commercial development, and clinical implementation of hybrid PET/CT Scanners.” The technology Drs. Townsend and Nutt developed is widely used across the world as a

diagnostic tool in the field of oncology, with growing applications in neurology and cardiology. CT is an anatomic imaging modality, widely used for diagnostic purposes in medicine. It has high spatial resolution, however it does not provide any functional information about the tissue and in many situations contrast is low, limiting the sensitivity and specificity in a diagnostic setting. PET is a functional/molecular imaging technique that uses radiotracers that can provide high contrast images of tumors, but with lower spatial resolution and very limited anatomic information. The

integration of these two complementary modalities into a single hybrid PET/CT imaging device revolutionized diagnostic imaging, especially in cancer, by enabling precise spatial registration of anatomy and function in a single diagnostic imaging examination, improving the specificity and sensitivity for tumor detection, staging of the disease, and in monitoring response to therapy.

PET/CT technology was first introduced into the marketplace in 1999. Five years later >95% of all PET scanners sold were hybrid PET/CT scanners, and by 2006 this number effectively reached 100%. Thus, this new PET/CT technology completely replaced stand-alone PET scanners in the market and achieved total market penetration. The three largest medical imaging equipment manufacturers (Siemens, General Electric and Philips) all produce PET/CT scanners. Total sales of PET/CT scanners in 2006 were >\$400M and the number of patient procedures worldwide per year is >1 million, the majority of which are performed on PET/CT scanners based on the invention of Drs. Nutt and Townsend. These PET/CT scanners have been used to detect cancers earlier, provide more accurate staging of cancers to better stratify patients for treatment, and to monitor early response to treatment to ensure patients are on the correct treatment regimen, and it is no exaggeration to say that many patients with cancer are alive today thanks in part to the information provided by a PET/CT scan. This technology also made a tremendous impact on academic and industrial imaging research. Papers coauthored by Drs. Townsend and Nutt on the subject of PET/CT have been cited more than 600 times, and have catalyzed the development of this new research field, resulting in many refinements and improvements in the

technology that are being incorporated into commercial PET/CT products. Thus their invention has indirectly led to a large number of M.S. and Ph.D. theses, millions of dollars of grant support through NIH to further develop PET/CT, and many new jobs in industry.

Drs. Nutt and Townsend have been well known members of the NPSS community for many years. Both are IEEE Fellows and have presented their work extensively at IEEE conferences and in IEEE journals. Dr. Townsend has served the field in numerous IEEE roles (including Associate Editor for *IEEE Transactions on Medical Imaging*) and will be General Chair for the 2011 IEEE NSS/MIC conference. He has received numerous awards, including the Academy of Molecular Imaging Distinguished Scientist Award. Dr. Nutt received an honorary doctorate of Medicine from the University of Essen (2008), was named Tennessee Industrial Scientist of the Year (2000) and received the Academy of Molecular Imaging Distinguished Scientist Award (1999). Drs. Nutt and Townsend's role in inventing PET/CT technology and turning it into a valuable diagnostic tool was honored as "Invention of the Year" in 2000 by TIME magazine, and as "Product of the Year" in 2002 by Frost and Sullivan.

Congratulations to Drs. Townsend and Nutt for this well-deserved honor! They will each receive a gold medal, a bronze replica, a certificate, and share a \$20,000 honorarium.

Nominations are now being sought for the 2011 Medal, which has a July 1, 2010 submission deadline. For nomination forms and more information, go to the NPSS web site or <http://www.ieee.org/portal/pages/about/awards/noms/healthcarenom.html>.

Cave canem

Never stand between a dog and a lamp-post.

Stanley Baldwin

FUNCTIONAL COMMITTEES



Poster announcing Igor Alexeff's visit



Alexeff at institute

Distinguished Lecturer Igor Alexeff Visits Kharkov Chapter

Igor Alexeff visited the Kharkov, Ukraine NPSS Chapter in December 2009 as a Distinguished Lecturer where he gave two presentations. The first was to the IXth Young Scientists Conference on "Electrodynamics, Photonics and Biophysics." The conference lasted 3 days (Dec. 1-3) and was conducted in English. He gave the opening talk, and a presentation on Ball Lightning. There were about 100 attendees in the audience.

His second presentation was the official Chapter presentation, given in a former private mansion to about 50 attendees, about half of whom were students and the other half senior scientists. This talk was a critical discussion on Controlled Thermonuclear Fusion. Ned Sauthoff, who is director of the USA portion of the ITER program, supplied about 60 excellent slides. Alexeff had also attended a plenary talk on the subject in November at the American Physical Society, Division of Plasma Physics meeting in Atlanta, GA., and so was informed of the latest progress and problems. There was a long discussion after the talk.

Alexi Kuleshov, who was working on an advanced degree with Professor Boris

P. Yefimov at the Usikov Institute of Radiophysics and Electronics of the Academy of Science of the Ukraine was Alexeff's host and he spent considerable time in their laboratory observing remarkable ball-lightning-like plasma discharges in air. Professor Yefimov had designed remarkable compact millimeter wave tubes in the past, and had many samples to show.

At the Museum of the Institute, there are many varieties of microwave tubes on display. The "Klinotron" tube uses an electron beam over a ridged resonator, and produces radiation at three-millimeter wave frequencies simultaneously.

On a city tour they visited a memorial park where the Communists executed 3000 Polish officers captured in World War 2, and buried them in a mass grave. At the former Gestapo headquarters in town they hanged undesirable people on two trees in front of the building.

Alexeff returned with a deep appreciation for the Ukrainian people and their accomplishments. The Ukraine is the second largest country in Europe (after Russia), and he looks forward to collaborating with them.