

Nuclear & Plasma Sciences

Number 1 • March 2005

SOCIETY NEWS

CONFERENCES



PARTICLE ACCELERATOR CONFERENCE

May 16-20, 2005

www.sns.gov/pac05; pac05@sns.gov

Knoxville Convention Center

Knoxville, Tennessee

The 2005 Particle Accelerator Conference (PAC05) will take place on May 16-20, 2005, at the Knoxville Convention Center (KCC) in Knoxville, Tennessee. The conference will cover new developments in all aspects of the science, technology, and use of accelerators. It will also provide a communication channel for accelerator scientists and engineers and for those interested in accelerator applications. The conference is open to the public, and all individuals with an interest in particle accelerators are invited to register and attend.

This is the 21st biennial conference in the series and is organized under the joint auspices of the

Institute of Electrical and Electronics Engineers (IEEE), through its Nuclear and Plasma Sciences Society (NPSS), and the American Physical Society (APS), through its Division of Physics of Beams (DPB). The conference also serves as the annual meeting of the DPB. The hosting institutions are Oak Ridge National Laboratory (ORNL) and Thomas Jefferson National Accelerator Facility (JLab). The conference is supported in part by the U.S. Department of Energy and the National Science Foundation.

In addition, the year 2005 is a special year for the community because the United Nations has declared

continued on page 3



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Conference Chair



**Swapan
Chattopadhyay**
Scientific Program Chair



Stuart Henderson
Local Organizing
Committee Chair



Kathy Rosenbalm
Conference
Coordinator

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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 15, 2005.

CONTRIBUTED ARTICLES

News articles are actively solicited from contributing editors, particularly related to important R&D activities, significant industrial applications, early reports on technical break-throughs, 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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it the World Year of Physics in honor of the 100th anniversary of Einstein's three discoveries that had, and still have, a remarkable impact on accelerator science (light quanta, Brownian motion, and the special theory of relativity). On Wednesday afternoon of the conference, a special session—organized by PAC and its sister European and Asian conferences EPAC and APAC—and a cultural event will honor this anniversary, with participation from the public, local officials, and government representatives from various agencies.

The conference chair is Norbert Holtkamp of ORNL's Spallation Neutron Source (SNS). The PAC05 Scientific Program Committee, chaired by Swapan Chattopadhyay of JLab, has already structured the conference program. The program, publication instructions, and all other relevant information are available on the conference web site at www.sns.gov/pac05. The head of the Local Organizing Committee is Stuart Henderson of ORNL/SNS. Additional information can be obtained from the Conference Coordinator:

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More than 1700 abstracts have been received for PAC05. The proceedings, which will be edited by a team representing accelerator facilities from all over the world, will be published by IEEE and will be available on CD-ROM and on the Joint Accelerator Conferences Web Site (www.jacow.org). All abstract and paper submissions must be uploaded through the web system. Authors are also required to bring a hard copy of their paper and a completed IEEE copyright permission form to the conference.

To register for PAC05, please complete the online registration form at the web site, which will be available on February 3, 2005. The registration fee is \$495; however, a reduced fee of \$395 is available to those who register and pay before March 18, 2005. This fee covers participation in all official conference events, including the welcome reception, conference sessions, coffee breaks, concert, "Einstein in the

City" event, banquet, awards ceremony, and one CD-ROM of the proceedings. The registration fee does not cover additional banquet tickets, the Saturday SNS tour, or companion tours. When signing up for these additional activities, an additional fee will be added, as indicated on the registration form. A link to the Knoxville Tourism and Sports Corporation is available for more information about the companion tours and pre- and post-conference travel packages.

SCIENTIFIC PROGRAM

The organization of the scientific program is similar to previous conferences in this series, with plenary sessions on Monday morning and Friday afternoon. The opening plenary session will feature talks by B. Barish (CalTech) on "Linear Collider Technology Decision," W. Nazarewicz (University of Tennessee) on "Science of Rare Isotope Accelerator (RIA) and the Project Status," J. Seeman (Stanford Linear Accelerator Center) on "PEP-II/KEK-B Operational Status," T. Roser (Brookhaven National Lab) on "RHIC Operational Status," and D. McGinnis (Fermi National Accelerator Lab) on "FNAL Tevatron Operational Status." The closing plenary session talks will include T. Mason (ORNL/SNS) on "Science with SNS," P. Schneider (DESY) on "XFEL/Short Pulse Science," and C. Jarlskog (Lund University) on "Physics Expectations from Future Accelerators." Two plenary talks have not yet been finalized.

The five-day conference will include about 20 oral sessions, with more than 200 invited speakers and selected contributed papers. Seven poster sessions, sized to accommodate more than 1400 posters, are scheduled. Presentations will be grouped into the following sessions:

- accelerator technology
- advanced concepts
- application of accelerators; secondary beam facilities: neutrons, muons, neutrinos and photons
- controls and computing
- development in the south, east, and mid-east/light sources
- development in the south, east, and mid-east/nuclear physics, high-energy physics
- extreme beams
- high-energy hadron accelerators and colliders
- instabilities and feedback



Charlie Horak
Editor-in-Chief

Privy pensée

Privacy is like property in this: that while a few people ought to have less of it, most people ought to have more of it.

G.K. Chesterton

Let me think about it

The whole problem of the world is that fools and fanatics are always so certain of themselves, and wiser people so full of doubts.

Bertrand Russell

Acid test

The [U.S.] grid has grown so complex that no one understands it. That makes it perfect for congressional hearings.

Robert Park

- instrumentation
- light sources and free-electron lasers
- linear colliders
- single particle dynamics and optics
- lepton accelerators and colliders
- low- and medium-energy accelerators and rings
- magnets
- multiparticle beam dynamics
- pulsed-power and high-intensity beams/induction linacs
- radio-frequency systems
- sources and injectors
- two-stream instabilities and collective processes

INDUSTRIAL EXHIBITION

An industrial exhibition of about 60 booths, situated adjacent to the technical sessions and the posters, where companies can advertise their products and expertise, will be open from noon to 5:00 p.m. on Monday and from 9:00 a.m. to 5:00 p.m. on Tuesday and Wednesday. The cost of an 8 by 10 foot booth is \$2200 (U.S.). This fee includes one full conference registration, CD-ROM of the proceedings, two banquet tickets, and a vendor reception hosted by Knoxville/Oak Ridge community leaders. Online registration will be available on the conference web site beginning February 3, 2005. Sponsorship opportunities for the reception, refreshments, and supplies are also available. Our sponsorship listing is available on the web site and sponsors will be fully acknowledged at the conference and in the conference program. Further information on exhibiting or sponsorship can be obtained by contacting Craig Deibele at deibele@sns.gov.

ACCOMMODATIONS

Approximately 1200 participants have attended the last few meetings in the series, and similar numbers are anticipated for PAC05 in Knoxville. A block of rooms at several downtown Knoxville hotels has been reserved. Please check the PAC05 web site for further details. Attendees should book directly with the hotel and are encouraged to book early. When making reservations, be sure to indicate attendance at PAC05 to receive the conference rate.

COMPANION PROGRAM

The conference has arranged an extensive companion program. The program begins on

Monday morning with a Companion Get-Acquainted Reception at the KCC that will include a continental breakfast. Prearranged tours depart Monday through Saturday mornings, returning in the late afternoon. The tours are being offered by the Knoxville Tourism and Sports Corporation. The six tours and their costs (in daily order) are: Historic Knoxville City Tour (\$67.00), A Step Back in Time (\$39), A Day at Dollywood and Pigeon Forge Outlets (\$55), A Day in Old Appalachia (\$59), Wild Mountain Tour (\$41), and Secret City Tour (\$53). Please see the PAC05 web site for more information about the tours. The registration deadline is April 25, 2005.

OTHER INFORMATION

The conference banquet will be held on the terrace of the KCC beginning at 7:00 p.m. on Thursday, May 19, 2005. The cost of the banquet is included in your registration fee, but a reservation is required for planning purposes.

The Awards Reception and Ceremony will take place on Wednesday, May 18, to present the following 2005 awards and prizes:

- APS Robert R. Wilson prize
- APS Award for Outstanding Doctoral Thesis Research in Beam Physics
- APS Student Travel Awards
- IEEE NPSS Particle Accelerator Science & Technology Awards
- U.S. Particle Accelerator School Prize for Achievement in Accelerator Physics & Technology
- Newly Elected Fellows of the APS
- Newly Elected Fellows of the IEEE

Several meeting rooms are available for incidental satellite meetings during the week of the conference. Audiovisual equipment and food and beverage charges will be billed at the convention center rate. To reserve a meeting room, please contact Doris Shubert at shubertdc@sns.gov.

Conference attendees will have access to Internet-connected laptops and printers. Wireless Internet connections will also be available throughout the KCC.

Knoxville weather in May is generally mild, with average daytime highs in the low-to-mid 70s and average nighttime lows in the high 50s to low 60s (F).

We look forward to seeing you in Knoxville in May!

The 2005 REAL TIME CONFERENCE – RT2005

4 -10 June 2005

Alba Nova University Centre
Stockholm, Sweden

<http://www.sysf.physto.se/RT2005/>

It is a great pleasure for us to announce the forthcoming 14th IEEE Real Time Conference 2005. It will be held at the Alba Nova University Centre in Stockholm, Sweden, 4-10 June 2005.

As in previous conferences in this series, RT2005 will be a multidisciplinary conference devoted to the latest Real Time computing applications in plasma physics, nuclear physics, particle physics, astrophysics, space science, accelerators, and in medicine and biology. The conference philosophy is to have only plenary sessions. New this year is the addition of mini-oral presentations for the poster papers. We will also invite more speakers who will give introductory overviews to help in bridging the different fields and topics. All this taken together lays the ground for an extremely stimulating environment and ample opportunity for discussions and fruitful exchanges.

CONFERENCE TOPICS

- Real Time System Architectures
- Front-end Signal Processing
- High Speed Synchronous Control
- Trigger and Data Acquisition
- Event Building and Fast Networks
- Online Processing Farms and
- High Level Triggers
- Online Databases
- Controls and Monitoring Systems
- Medical Systems and Data Processing
- Emerging Real Time Technologies

TUTORIALS AND SHORT COURSES

More information can be found at the conference Web site: <http://www.sysf.physto.se/RT2005/>

Submission of abstracts for oral presentations and posters is through the Web site beginning on December 13th, 2004. The submission deadline is February 27, 2005. The submissions should include an abstract of about 100 words and a summary of maximum two pages.

As in the past, this conference will have only plenary oral and poster sessions.

Oral presentations: All oral presentations will be allocated 20 minutes which includes about 5 minutes for questions and discussion. One video projector will be provided in the auditorium, connected to a PC and using Powerpoint and PDF format. It also accommodates transparencies as well as paper printed in landscape format.

New this year! Mini Oral/Poster presentations: A new way of presenting and promoting the poster session will be organized. Each poster will be introduced by the proponent in a mini oral presentation of 3 minutes/3 slides during the relevant plenary sessions.

Attendance at the poster sessions is organized around conference breaks. Authors are requested to set up their posters before the morning break of the day of their assigned poster session. Each poster board has a mounting surface of dimensions: 120 cm high by 240 cm wide. The posters are attached to the surface with push-pins. Material to attach the posters will be provided by the organizers. The poster exhibit area will be adjacent to the break refreshment area. Authors are requested to be at their posters during their poster session.

Publication: The **Conference Proceedings** will include all papers that have been accepted for oral and poster presentation and that have actually been presented.

A **CD of the Proceedings** will be shipped within one month after the conference to all participants containing texts as well as presentations and photos of the event.

Authors of all papers included in the Conference Proceedings have, in addition, the opportunity to submit manuscripts for publication in the **IEEE Transactions on Nuclear Science (TNS editor Jean-Pierre Dufey)** which will publish a special issue devoted to the 2005 Real Time Conference. All papers submitted to TNS are subject to a peer review process.

For both publications, the format of the **paper must comply with the IEEE editing rules**. Please note that the pages must not be numbered and no header or footer information is accepted. The deadlines for the sub-



Richard Jacobsson
General Chairman



Patrick Le Dû
CANPS Committee



Jean-Pierre Martin
CANPS Chair

Politics 1, Science 0

In this administration, science strongly informs policy. It is important to remember, however, that even when the science is clear - and often it is not - it is but one input into the policy process.

John H.
Marburger III

missions are :

- The day before the presentation of the paper for the Conference Proceedings
- One week after the last day of the Conference, that is June 19, 2005, to be

considered for publication in TNS.

Awards: One senior award and two student (New!) awards for the best work submitted and presented as either oral or poster papers will be presented.

CONFERENCE COMMITTEE AND SUPPORT

<i>General Chair</i> : Richard Jacobsson	CERN
<i>Local organizing committee</i>	
Christian Bohm (Chair)	Stockholm University, Sweden
Sten Hellman	Stockholm University, Sweden
Stig Larsson	Karolinska Institute, Sweden
Bengt Lund-Jensen	Royal Institute of Technology, Sweden
Mark Pearce	Royal Institute of Technology, Sweden
Samuel Silverstein	Stockholm University, Sweden
<i>Executive committee (New)</i>	
Christian Bohm	Stockholm University, Sweden
Christian Boulin	EMBL, Germany
Richard Jacobsson	CERN
Anthony Lavietes	Lawrence Livermore National Laboratory, USA
Patrick Le Dû (Chair)	CEA, France
Jean-Pierre Dufey	CERN
Ray Larsen	Stanford Linear Accelerator Center, USA
Jean-Pierre Martin	University of Montreal, Canada
<i>Scientific committee</i>	
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Pierre Andre Amaudruz	TRIUMF, Canada
Fabrizio Barone	University of Salerno, Italy
Christian Bohm (Chair)	Stockholm University, Sweden
Anders Brahme	Karolinska Institute, Sweden
Denis Calvet	CEA, France
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We look forward to welcoming you to Stockholm!

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15th IEEE INTERNATIONAL PULSED POWER CONFERENCE

An Invitation to PPC2005 in Monterey, California

Visit our website at <http://www.sandia.gov/ppc2005/>

We cordially invite you to the 15th IEEE International Pulsed Power Conference to be held in Monterey, CA, June 13 to 17, 2005. The conference, held at the Portola Plaza Hotel and the adjacent Monterey Convention Center, is located at the very heart of the beautiful Monterey Peninsula with a contrast of balmy, pristine beaches and dramatic, rugged cliffs.

Modern pulsed power has its genesis in the pioneering work of the late John Christopher Martin and his colleagues at the Atomic Weapons Establishment in Aldermaston, England in the 1960s. "Charlie," as he was known to the community, was a hydrodynamicist who could not purchase an adequate X-ray radiography source to image the dynamic phenomena in which he was interested. As a result he pursued a new generation of radiography sources that were based on high power Marx generators coupled with low impedance transmission lines and cold cathode

single-stage accelerating gaps. Thus was modern pulsed power born.

Pulsed power science and technology rapidly disseminated to the USA, former Soviet Union and the present-day Russia, Europe and Asia. Pulsed power refers to the technology whereby energy is accumulated over a relatively long period of time, and then compressed in a short period of time to deliver very large power pulses to a load. Pulsed power has been an enabling technology for particle beam diodes, imploding plasmas, and other primarily defense-related applications. Today, Pulsed Power is used to drive biological experiments, purify water from municipal drinking supplies and effluents from combustion processes, etc, evolving to become an important technology in the environmental and biomedical arenas.

This biennial conference is the principal forum for the exchange of information on

And most do

Any fool can be 60, if he lives long enough.

George Bernard Shaw



John Maenchen
General Chair



Edl Schamiloglu
Scientific Program Chair

pulsed power science and technology and the conference proceedings serve as the major archival source of papers published in this field. PPC2005 registration is Monday, June 13th, with technical sessions Tuesday through Friday. PPC2005 immediately precedes the 32nd IEEE International Conference on Plasma Science (ICOPS 2005), repeating the successful teaming of the two conferences that

first took place in Monterey in 1999. ICOPS 2005 starts the following Monday, June 20th at the same location to enhance the interaction between these two communities. As shown in the calendar below, an ICOPS minicourse "The Physics of Z Pinches" will unite the two conferences.

We look forward to welcoming you to Monterey.

June 2005

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13 PPC registration Reception	14 PPC	15 PPC Banquet	16 PPC Aquarium	17 PPC	18 Minicourse
19 ICOPS registration Minicourse Reception	20 ICOPS	21 ICOPS Banquet	22 ICOPS	23 ICOPS	24	25
26	27	28	29	30		

ICOPS 2005
INTERNATIONAL CONFERENCE
ON PLASMA SCIENCES
Monterey, California
20-23 June 2005



We wish to extend a cordial invitation to the 32nd IEEE International Conference on Plasma Science (ICOPS) to be held in Monterey, California 20-23 June 2005 with a minicourse scheduled 18-19 June. The venue is the Portola Plaza Hotel, formerly the DoubleTree Hotel, on the harbor in Monterey. ICOPS 2005 will be preceded by the 15th IEEE International Pulsed Power Conference, 13-17 June, also at the Portola Plaza.

Plasma science covers a wide range of topics, both fundamental and applied. ICOPS will offer a balanced program of technical presentations spanning the range. Overall topics include:

- Basic Processes in Fully and Partially Ionized Plasmas
- Microwave Generation and Plasma Interaction
- Charged Particle Beams and Sources
- High Energy Density Plasmas and Their Interactions

- Industrial, Commercial, and Medical Applications of Plasmas
- Plasma Diagnostics
- Pulsed Power and Other Plasma Applications

ICOPS will be held at the Portola Plaza Hotel and in the adjoining Monterey Conference Center, Monday 20 June through Thursday 23 June 2005. The Portola Plaza and Conference Center will also host the biannual IEEE Pulsed Power Conference (PPC), Monday 13 June through Friday 17 June, 2005. These contiguous conferences are distinct but those registrants for both ICOPS and PPC will receive a reduction in the registration fees for both meetings. Over the weekend spanning the PPC and ICOPS, there will be a minicourse on The Physics of Z-Pinches organized by Jack Davis of the Naval Research Laboratory and Christopher Deeney of Sandia National Laboratories; the minicourse is organized as part of ICOPS. Complete information on ICOPS can be obtained at www.icops2005.org.

There is a link on this website for registration and abstract submission. Information on PPC can be found at www.sandia.gov/ppc2005.

The town of Monterey is located on the Monterey Peninsula about 100 miles south of San Francisco, just north of Carmel and the Big Sur coast. The geography is complex and stunning; the town is rich in history and culture. There are numerous recreational activities and destinations that include spectacular natural land- and seascapes, truly world-class golf, possi-

bly the planet's best aquarium, local missions, historic Fisherman's Wharf and Cannery Row. Wineries are close at hand, shopping is excellent and widely varied, and restaurants serve fresh fare - seafood from just offshore and produce from just over the hills. June is well beyond the rainy season and the weather is generally sunny and cool. Monterey is a great place to work and relax. There is commercial air service into Monterey or you can arrive via a pleasant drive through the Coast Range from any of the Bay Area airports.

RADIATION EFFECTS CONFERENCE

2005 NSREC Set for Seattle

The 2005 IEEE Nuclear and Space Radiation Effects Conference (NSREC) will be held July 11-15, 2005 in Seattle, Washington at the Seattle Sheraton Hotel and Towers. The conference features a Technical Program consisting of ten sessions of contributed papers that describe the latest observations and research results in radiation effects. Also included is a Short Course, presented on July 11, that will emphasize scaling effects in modern microelectronic devices and the likely effects of continued progression in device scaling on radiation susceptibility in space, a Radiation Effects Data Workshop, and an Industrial Exhibit. The Technical Program includes oral and poster sessions. There will also be special events for companions in a parallel social program. Supporters of the Conference include the Defense Threat Reduction Agency, Sandia National Laboratories, Air Force Research Laboratory, the Jet Propulsion Laboratory, NASA Goddard SFC, and Aerospace Corporation.

TECHNICAL PROGRAM

Papers to be presented at this meeting will describe the effects of space or nuclear radiation on electronic or photonic devices, circuits, sensors, materials, and systems, as well as semiconductor processing technology and design techniques for producing radiation-tolerant devices and integrated circuits. A new session that was initiated last year on radiation-hardening by design has been continued because of the high interest for space and defense systems. The conference will be attended by engineers, scientists and managers who are concerned with radiation

effects. International participation in the conference is strongly encouraged.

Specific topics for technical papers that will be presented at this conference include the following:

Basic Mechanisms of Radiation Effects in Electronic Materials and Devices

- Ionizing radiation effects
- Displacement damage effects
- Radiation effects on materials
- Single-event charge collection phenomena and mechanisms
- Processing-induced radiation effects
- Radiation transport, energy deposition and dosimetry

Radiation Effects on Electronic and Photonic Devices and Circuits

- MOS, bipolar and advanced technologies
- SOI and SOS technologies
- Optoelectronic and optical devices, and optical systems
- Novel devices structures, such as MEMS
- Single-event effects
- Modeling of devices, circuits and systems
- Methods for radiation hardening by design and manufacturing
- Radiation effects at cryogenic temperatures
- Particle detectors and associated electronics at high-energy accelerators

Space, Atmospheric and Terrestrial Radiation Effects

- Characterization and modeling of radiation environments
- Space weather effects
- Spacecraft charging



Dismembered

I'm not a member of any organized political party. I'm a Democrat.

Will Rogers

I object!

Great reforms offend great interests.

Winston Churchill

Hardness Assurance Technology and Radiation Testing

- Testing techniques and guidelines
- Hardness assurance methodology
- Dosimetry

Radiation Effects on Commercial Space Systems

New Developments of Interest to the Radiation Effects Community

RADIATION EFFECTS DATA WORKSHOP

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

PAPER SUBMITTAL

Information on the submission of summaries to the 2005 NSREC for either the Technical Sessions or the Data Workshop can be found at www.nsrec.com. The deadline for submitting summaries was February 4, 2005, and final selection of papers will be made in March. A limited number of late-news papers will be considered for the conference, but must be submitted by May 30. Late-news papers must clearly show why they are newsworthy, as well as technically significant.

Papers accepted for the conference are eligible for publication in the December issue of the IEEE Transactions on Nuclear Science, subject to an additional review cycle after the conference. Papers presented at the Workshop will be published in a special IEEE publication following the conference that is not subject to an additional peer review.

SHORT COURSE

Attendees will have the opportunity to participate in a one-day Short Course on Monday, July 11. This one-day Short Course will address several evolving problems that are important when modern microelectronic devices are used in space. The motivation stems from the rapid evolution of microelectronic device design and manufacturing. This has allowed devices to be designed with very high density, extreme complexity and markedly improved performance. Although those

manufacturing trends improve some aspects of radiation hardness, they also raise new issues and concerns that impact their performance in space that have not been addressed in previous short courses at this conference. Much of the material presented in the course will emphasize scaling effects, and the likely effects of continued progression in device scaling on radiation susceptibility in space environments. Allan Johnston of the Jet Propulsion Laboratory, the 2005 Short Course Chairman, has organized a highly qualified team of lecturers for these topics. Four different talks will be presented. Experts in the semiconductor industry will give the first two talks, providing special insight into scaling effects, technology evolution and soft-error sensitivity of unhardened commercial microelectronics. The pace of change in this industry is affected by economic factors and capitalization costs as well as technical requirements. The last two talks will be given by experts in the radiation effects community, discussing two specific issues – total dose effects and single-event transients in linear circuits – that will include hardened devices as well as commercial devices.

In the first section of the short course, Prof. Scott Thompson, University of Florida, will discuss trends in transistor technology for nanoscale devices. The era of simple device scaling is over, with progress now being made via new materials and changes in the device structure. The session will interpret the Semiconductor Industry Association Roadmap, beginning with short-term topics related to scaling that are expected to be in production during the next 5 years, such as nanoscale MOSFETs, strained silicon, and high-k gates. This will be followed by a discussion of long-term topics that are ahead of initial projections, as well as some that are off the main stream, but offer high potential for advances in scaling and performance. These include carbon nanotubes, silicon nanowires, and single-electron devices for both logic and memory applications.

The second talk by Dr. Robert Baumann, Texas Instruments, will discuss the extensive work done by integrated circuit manufacturers to deal with terrestrial radiation effects from neutrons produced in the upper atmosphere, and alpha particles emitted by materials within integrated circuits and packages. Those issues became relevant more than twenty years ago, and are now mainstream concerns of the commercial electronics industry. He will discuss

mechanisms, test structures and test methods used to determine soft-error rates for commercial devices, as well as the JEDEC Test Standard used by manufacturers to measure and validate soft-error rates. The effects of device scaling on soft-error susceptibility will also be discussed. The talk will conclude with a comparison of the environments and issues considered by manufacturers to the more severe environments encountered in space.

After lunch, Prof. Hugh Barnaby, Arizona State University, will discuss several key issues associated with deep submicron and nonclassical devices as well as advanced materials in the space radiation environment. There are, as outlined in the ITRS roadmap, numerous challenges ahead for commercial industry in its effort to track Moore's Law down to the 45 nm node and beyond. While many of the classical threats posed by the space radiation environment have been diminished by aggressive semiconductor scaling, the question remains whether there may be unknown, potentially worse threats, lurking in the deep submicron regime. In this course, Dr. Barnaby will provide a basic overview of some of the materials, devices, and designs that are being explored or, in some cases, used today. He will review space radiation threats and how the impact of radiation is characterized. The last part of the course will include a detailed discussion of what we know now about how modern devices and materials respond to radiation and how we may assess, through the use of advanced analysis and modeling techniques, the relative hardness of future technologies.

Steve Buchner, QSS/NASA Goddard Space Flight Center, will wrap up the Course with a talk on transients in linear integrated circuits that are produced when they are exposed to high-energy particles. This is a complex problem that affects many types of hardened linear circuits as well as unhardened commercial devices that are selected and qualified for space applications. He will discuss mechanisms and circuit-related issues for linear transients, testing methods, and special diagnostic techniques, including the use of pulsed lasers to determine the sensitive regions within complex linear circuits that produce output transients. Examples of the effects of transients in fielded space systems will also be discussed.

This cohesive set of talks is geared toward designers, radiation effects engineers, component specialists and other technical and man-

agement personnel that are involved in developing space systems. Each lecturer will develop the core content of their respective topics from initial background material, allowing the course to benefit both new and experienced engineers, scientists and managers. In-depth notes will be provided. For those interested in Continuing Education Units (CEUs), there will be an open-book test at the end of the course. The course is valued at 0.6 CEUs, and is endorsed by the IEEE and the International Association for Education and Training (IACET).

INDUSTRIAL EXHIBIT

An Industrial Exhibit will be included as part of the Conference. The exhibit will be held on Tuesday and Wednesday. It will include exhibits from 35-40 exhibitors that represent companies or agencies involved in manufacturing electronic devices or systems for applications in space or nuclear environments, modeling and analysis of radiation effects at the device and system level, and radiation testing.

LOCAL ARRANGEMENTS

The main social event for the Conference will be a 4-hour adventure that includes a boat cruise on Elliot Bay, a delicious buffet featuring traditional Indian-style baked salmon, a spectacular stage show, and time to explore the forested trails and picturesque beach walks on Blake Island State Park. Local expert Mark Baze will lead a guided hiking excursion. The Indian Cultural Center will be reserved exclusively for the conference during the evening, allowing attendees and family members the opportunity to network and visit in a relaxed atmosphere.

Companion events include a family-friendly tour of the Hiram M. Chittenden Locks, part of the 8-mi Lake Washington Ship Canal that connects freshwater Lake Washington and Lake Union with the salt water of Shilshole Bay and Puget Sound. Visitors will also have a chance to observe how the marine population makes the same journey from saltwater to fresh water on the fish ladder, whose 21 levels form a gradual incline that allows an estimated half million salmon and trout to swim upstream each year. A tour of the Chateau St. Michelle winery and elegant sit-down luncheon is also planned.

SEATTLE

The combination of water, hills and lush greenery, set against a backdrop of far-off mountains,

Restraint

Though the object of being a Great Power is to be able to fight a Great War, the only way of remaining a Great Power is not to fight one.

A.J.P. Taylor

Hard sell

It is difficult to bring men together for constructive action, but easy enough to league them against a minority.

André Maurois

In a secure rut

It is better to do something [politically] absurd which has always been done, than to do a wise thing which had never been done before.

Arthur Balfour

including the spectacular Mt. Rainier, makes Seattle one of the most beautiful urban areas in the USA. Truly, the bluest skies are in Seattle, and the days are long and warm in July, where the amount of rainfall is less than Phoenix during that month. Everyone takes advantage of the outdoors! This easily accessible and user-friendly city has numerous fine restaurants, interesting museums, and a vigorous arts scene in the downtown area. Unique attractions, such as the Pike Place Market, draw many locals and visitors through displays of wearable art, fresh fruits, vegetables, and huge bouquets of fresh flowers that fill the senses with wonderful colors and delicious scents. Cycling and walking trails interlace the urban area, and local ferries interconnect nearby islands, providing yet another fun and unique way to tour the area. Seattle is also a major US port and boasts modern cruise ship facilities for trips to Alaska.

CONFERENCE COMMITTEE

General Chair: Fred Sexton
Sandia National Laboratories, (505) 844-3927
Technical Program: Mike Xapsos
NASA/GSFC, (301) 286-2263
Short Course: Allan Johnston
Jet Propulsion Laboratories, (818) 354-6425
Finance: Ron Lacoce
The Aerospace Corp, (310) 336-0118
Local Arrangements: Kay Jobe
Boeing Space Systems, Co, (310) 416-3705
Publicity: Teresa Farris
Aeroflex Colorado Springs (719) 594-8035
Awards: Jim Kinnison
Johns Hopkins/Applied Physics Laboratory,
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Industrial Exhibits: Nazik Maloyan
International Rectifier, Inc, (310) 726-8412
Guest Editor: John Cressler
Georgia Tech, (404) 894-5161

FINAL REPORT

2004 NUCLEAR SCIENCE SYMPOSIUM AND MEDICAL IMAGING CONFERENCE

Including the Symposium on Nuclear Power Systems
14th Room Temperature Semiconductor X- and Gamma-Ray
Detectors Workshop and Special Focus Workshops
(Rome, Italy, October 16-22, 2004)

<http://www.nss-mic.org/2004>

The Nuclear Science Symposium, Medical Imaging Conference, Symposium on Nuclear Power Systems, and the 14th International Workshop on Room Temperature Semiconductor X- and Gamma-Ray Detectors was held for the first time in Italy, in the prestigious city of Rome, on October 16-22, 2004. The conference under the "patronage" of Mr.

Philippe Busquin, Member of the European Commission and of the Italian Ministry of University and Research was sponsored by the Nuclear and Plasma Sciences Society of the IEEE, the University of Pisa, the Department of Physics of the University of Pisa, the Istituto Nazionale di Fisica Nucleare (INFN), CERN, the Associazione per lo Sviluppo Scientifico e



Alberto Del Guerra
General Chair



Fabio Sauli
NSS Program Chair



Sibylle Ziegler
MIC Program Chair

Tecnologico del Piemonte (ASP), the National Institutes of Health (NIH), and the Municipality of Rome.

The Conference has been also supported by several companies listed below in alphabetical order:

CDC S.p.A., CPS Innovations, CTI-Concorde LLC, GARR, General Electric Global Research, Hamamatsu Photonics Italia s.r.l., ORTEC, Philips Medical Systems, Progamatica S.p.A., Siemens Medical Solutions.

The venue of the conference was the Ergife Palace Hotel, one of the largest exhibition and congress areas in Europe. The Nuclear Science Symposium has been an outstanding meeting for scientists and engineers working in the fields of nuclear science, radiation instrumentation, software and their applications. The Medical Imaging Conference was once again an extremely productive scientific meeting of international experts on the physics, engineering, and mathematical aspects of nuclear imaging in medicine. The Room Temperature Semiconductor Detectors workshop has joined in for the second year in a row, bringing an additional forum of scientists and engineers working to develop new solid-state radiation detectors and imaging arrays.

Two excellent sets of short courses were given at the start of the NSS/MIC programs, covering a wide range of nuclear and medical technology. One set was mostly related to NSS topics (SC1: Radiation Detection and Measurement; SC2: Detectors for Astroparticle and Synchrotron Radiation Experiments; SC3: Semiconductor Strip, Pixel and Voxel Arrays; SC4: GEANT4). The other set was principally related to MIC topics (SC5: Detectors for SPECT and PET; SC6: Biomedical Applications of Particle Detectors; SC7: Optical Imaging; SC8: Statistical Methods for Image Reconstruction).

We were fortunate to receive many grants from public institutions and private companies toward the financial support of PhD students and young post-docs. In addition, an INTAS grant and an FP6 grant from the European Union have allowed support for scientists from Russia and other Eastern Countries. A summary is presented in Table 1. Portions of some grants were specifically targeted for short course fees. In total, more than 300 attendees enrolled in the short courses.

Table 1 - Grants and Educational Program Sponsor Number of Grantees

Sponsor	Number of Grantees
•INFN (Italy)	12
•IEEE [Short Courses]	2
•NIH (USA)	35
•NIH [Short Courses] (USA)	9
•(Medical Imaging) Companies	22
•INTAS (EU)	20
•FP6 (EU)	6
•ASP (Italy)	4

The Industrial Program was extremely successful. Almost 50 companies from all around the world were present to demonstrate their latest products in detectors, pulse processing instrumentation, imaging, software, and other associated areas. The exhibition was complemented by a series of seminars and technical presentations, which allowed an in-depth exchange of information between attendees and exhibitors on existing products, future developments and needs.

The entire Conference program extended over an eight-day period (including the NRBC workshop), the time schedule for which is listed in Table 2.

Table 2 - Time slots allocated to the various events of the Conference

•Short Courses	(3.5 days)
•Nuclear Science Symposium	(4 days)
•Medical Imaging Conference	(3.5 days)
•RTSD	(3.5 days)
•SNPS	(1 day)
•GW Workshop	(1 day)
•SR Workshop	(1 day)
•NRBC Workshop	(1.5 days)
•Industrial Program	(3 days)

We received an extraordinary number of abstract submissions: more than 1650 in total. This number sets an all-time record for the Conference. An outstanding scientific program was laid down by the chairs of the various tracks with the help of more than 400 reviewers.

The total number of registered participants has also set an all-time record with a final number of 1835. The participation by country is shown in Figure 1. Europe had the largest attendance with a total of 55.23%, followed by North America (31.23%) and then Asia (12.17%), while the remaining countries

Saving grace

The only thing that saves us from the bureaucracy is inefficiency. An efficient bureaucracy is the greatest threat to liberty.

Eugene
McCarthy

Boom!

She is not so much a loose cannon as heavy artillery.

Frank Gannon,
(Teresa Heinz
Kerry's speech-
writer)

You can bet on it

The reason academic disputes are so bitter is that the stakes are so low.

Henry Kissinger

Show me!

Provability is a weaker notion than truth.

Douglas Hofstadter

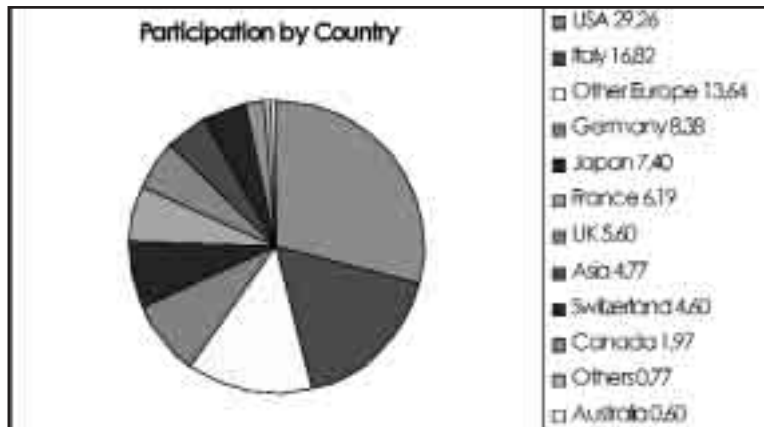


Figure 1: Participants to the conference subdivided by country

reached 1.37%. The subdivision among the various categories is represented in Table 3. If one considers the registered accompanying persons and the additional attendees at the NRBC workshop, the total number exceeds 2200.

Table 3 – Attendee breakdown by various categories

• IEEE Member	368
• IEEE Student	103
• Non-IEEE Member	789
• Non-IEEE Student	237
• One-day only	86
• Short Courses only	21
• Retired/Unemployed	16
• Committee Members & Invited speakers & staff	72
• Exhibitors	143
Total	1835

The Grand Opening of the Conference (see Fig. 2) was held on Monday 18 October, chaired by the General Chair, Alberto Del Guerra, with the participation of the president of INFN, Prof. Roberto Petronzio, the Director of the Sezione INFN of Pisa, Prof. Rino Castaldi, the vice-rector of Pisa University, Prof. Enrico Giaccherini, the Director of the Physics Department of Pisa University, Prof. Paolo Rossi and the official representative of CERN, Dr. Jean-Marie Le Goff. Following the Grand Opening, two distinguished invited speakers shed light on subjects of general interest: Prof. Pier Andrea Mandò (Florence University) on “Nuclear Techniques for the Cultural Heritage,” and Dr. Lothar Strüder, (Max Plank Institute, Munich) on “Semiconductor

Detectors - In Heaven and on Earth.”

The opening session was followed by the traditional NSS Luncheon, during which Prof. Ugo Amaldi (University of Milano Bicocca and TERA Foundation) gave an excellent talk on “Advances in Radiotherapy: from the Discovery of X-Rays to Hadron Therapy.” As for the detailed NSS scientific program, the accepted papers were assigned to 44 parallel and two plenary poster sessions.

Moreover, two dedicated joint NSS-MIC sessions presented contributions bridging the fields of nuclear detectors and medical imaging.

The Medical Imaging Conference was officially opened on Wednesday, 20 October by two invited speakers: Professor Peter Morris from the Sir Peter Mansfield Magnetic Resonance Centre of the University of Nottingham (“Exploring the Mind with Functional Magnetic Resonance”), and Professor Michael Unser of the Swiss Federal Institute of Technology in Lausanne (“Medical Image Interpolation - the Quest for Higher Quality”). The MIC banquet on Thursday evening featured a lecture by Professor Giovanni Ettore Gigante from the University La Sapienza in Rome, who shared his experience in using physical techniques for the analysis and restoration of art works. As for MIC, the program included 10 oral sessions, and 4 non-overlapping poster sessions.

To foster poster sessions and young student participation, four poster awards were given, two for NSS posters and two for MIC posters, respectively.

The 14th International Workshop on Room-Temperature Semiconductor X-Ray and Gamma-Ray Detectors scientific program was arranged in 12 oral sessions and 1 poster session. The Symposium on Nuclear Power Systems was arranged in three oral sessions. This year, two one-day Workshops on “Sensing, Control and Readout of Gravitational Wave Detectors” and on “Synchrotron Radiation Detectors” were also held on Thursday 21 and on Friday 22, respectively. Finally, the “2004 Workshop on Nuclear Radiology of Breast Cancer” was run on Friday 22 and Saturday 23



Figure 2: The Opening Session, NSS/MIC Rome 2004

October, as a satellite workshop to the conference. A Conference Record CD-ROM is due for release early in 2005.

More than 200 Internet connections, both wired and wireless, were set up so as to satisfy the needs of the attendees in four separate locations, including the Exhibitor Area. The IEEE membership desk located near the Registration Desk, was run very efficiently by Vernon Price and attracted quite a number of new IEEE members.

Due to the extraordinary number of attendees all the social events were also sold out:

- Welcome Cocktail at Ergife Palace Hotel (Monday, October 18)
- Exhibitors Reception at Ergife Palace Hotel (Tuesday, October 19)
- Conference Dinner at Villa Miani (Wednesday, October 20).

The Tour program (which was also sold out) included Rome Seen from Its Belvederes, The Glories of Baroque Rome, Ostia Antica, Imperial Rome, Tivoli and Stately Homes, and The Vatican Museums,.

It was a tremendous job to organize and run such a huge conference. As is always the case, there were some flaws and difficulties. Nevertheless, I hope that the attendees were satisfied both with the scientific content and the general organization. If this is the case the merit goes entirely to the team of extraordinary friends and colleagues (see Fig. 3) who shared with me the burden of organizing this conference.

Alberto Del Guerra can be reached at: Department of Physics, University of Pisa, Via F. Buonarroti 2, 56127 Pisa, Italy; Phone: +39 050 2214942; Fax: +39 050 2214333 ; E-mail : alberto.delguerra@df.unipi.it



Figure 3: The Organizing Committee of the Rome 2004 NSS/MIC Conference

Did they do that??

Textron Inc. makes offer to screw company stockholders.

Headline in the Miami Herald

Too bad

Of course, Bizet never knew that Carmen was a great success until after his death.

Michael Barclay

PRESIDENT'S REPORT



Bill Moses
NPSS President

As I write this article a few days before New Years Eve, “out with the old and in with the new” seems to be a highly appropriate theme. The terms of four elected AdCom members (Tom Lewellen, Mark Rader, Erik Heijne, and Mike Unterweger) and three Technical Committee Chairs (Bob Reinovsky, Bruce Brown, and Christian Boulin) end in a few days and six new people will take over their positions on AdCom (Chris Deeney, Ron Jaszczak, Uwe Bratzler, Gerry Cooperstein, Ilan Ben-Zvi, and Jean-Pierre Martin). I would like to thank the outgoing members and Chairs for four years of hard work, and to welcome their replacements; I look forward to their contributions. I also welcome our new AdCom Vice-President, Jane Lehr of Sandia National Laboratory. Jane will become the AdCom President when my term is completed (in two years), and I’m confident that she will do an outstanding job. Although she was elected less than two months ago, she has already been a great help in running AdCom. Finally, I would like to thank Tony Lavietes for taking on the job of Assistant NPSS Treasurer, and Igor Alexeff and Peter Winokur for adding two more years onto their AdCom service in the roles performed by the Past-Presidents.

You may have also noticed that we have a new Editor for this Newsletter. I thank Albe Larsen for taking on the job and especially thank Ken Dawson for nine years of outstanding service as Newsletter Editor. I’m glad to say that Ken is staying on as Editor Emeritus, which means that we will continue to have all of the quips and quotes that have become an essential part of the Newsletter!

There have also been significant changes in the editorial staff of Transactions on Nuclear Science (TNS). The death of Ed Hoffman, who edited the papers submitted to the Medical Imaging Conference (MIC) portion of the NSS/MIC Meeting, coupled with John Valentine stepping down as the Editor for TNS manuscripts associated with the NSS, meant that we did not have Editors for approximately half of the papers that appear in TNS. It has been a challenging six months as we worked to recover from this double blow, but we are now

in excellent shape. During this time John Valentine and Paul Kinahan, as interim Editors, kept the flow of manuscripts from being interrupted while, in parallel, a committee led by Steve Gold took a close look at the TNS editorial process. This committee recommended two highly desirable changes: 1) add approximately a dozen Associate Editors, to create another editorial “layer” but reduce the work load on the Editors, and 2) eliminate the distinction between manuscripts submitted in association with a conference and those not associated with a conference. We are now implementing these changes and have an Editor-in-Chief (Paul Dressendorfer), four Senior Editors (Zane Bell for Radiation Instrumentation, Joel Karp for Nuclear Medical and Imaging Sciences, John Cressler for Radiation Effects, and Jean-Pierre Dufey for Real-Time Computer Applications), and are in the process of naming Associate Editors. The only changes that authors and readers should see are improved quality and consistency of review, as well as shorter review time!

The final change is one that is coming inexorably, but whose exact form is uncertain. That is Open Access, the idea that, as taxpayers have paid for the research that is presented in many refereed journals, these articles should be available to everybody at no cost. That is, if the research reported in an article was supported by government funding, the publisher of that article (such as IEEE) would have to provide an electronic copy of that article to anybody who requested it (even if they did not have a subscription to that journal). This movement is rapidly gaining momentum and my belief is that it will be common before my term as President is over. As a user of information, I eagerly await Open Access and applaud the concept. As a publisher of journals, it scares the pants off me. There are substantial costs associated with producing a journal, and it is uncertain just how these will get paid for in Open Access. At first glance it seems that putting an electronic manuscript on the Web should cost very little, and that is true provided that it is essentially a duplicate of an article that has already been produced in paper for-

Hope springs eternal

People don't understand the earth, but they want to, so they build a model, and then they have two things they don't understand.

Gerard Roe

mat. However, the number of printed copies of our publications is falling rapidly, so the electronic publication needs to share the cost to produce the “original” copy and may soon need to bear the entire cost. In addition, we demand more features from electronic articles than we do from paper, such as live links to the references in the manuscript (or to articles that cite the one we are reading), so the cost to produce electronic copy actually exceeds that to produce paper copy. Finally, IEEE provides literally millions of papers, and the overhead of managing all of them (as well as maintaining the systems to store and deliver them) is non-trivial. Thus, “Open Access” will probably not mean “Free Access,” as these costs must be

paid for. I do not know what form it will be — whether there will be a return to something like page charges, whether there will be some form of external support, or whether there will be some form of search or download fee. However, I’m certain that the way that IEEE charges for publications will change significantly in the next few years and I look forward to NPSS being part of the evolution.

If you have any thoughts on these or any other issues, please feel free to contact me.

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SECRETARY’S REPORT

The IEEE NPSS AdCom met on 23 October 2004 at the Ergife Palace Hotel in Rome, Italy for our second non-North American meeting. It was exciting to be able to see some of the second NSS/MIC conference held outside North America and to be amazed at the large attendance and dynamic program organized for this conference.

As this was our Annual meeting, it was a time when changes were announced, and I join with Bill Moses in extending thanks to the outgoing Class of 2004 AdCom members Tom Lewellen, Mark Rader, Erik Heijne, and Mike Unterweger and technical committee chairs Christian Boulin, Bruce Brown and Bob Reinovsky for four years each of dedicated service. I join in Bill’s delight with the election of Jane Lehr, just at the end of her first year of AdCom service, as our new Vice President, from a strong pool of vice-presidential candidates.

Ed Lampo, our Treasurer, reported that the conferences are, overall, doing well financially, but as always, late closings have to be watched. We also had an unbudgeted expense of \$50,000 in 2004 to buy computer equipment and projectors that can be used by our conferences and that will help reduce some of the very high rental charges. Anyone who is interested should contact Tony Laviertes at laviertes1@lbl.gov. TNS is somewhat behind schedule in 2004.

Bill Moses thanked two ad hoc committees, one assessing TNS and the other looking at membership issues, for their work. He also announced that Anthony (Tony) Laviertes of Livermore National Laboratory has been appointed Assistant Treasurer to give Ed

Lampo some help. Tony will assume principal responsibility for conference budgets and finance and will provide overall backup for Ed as needed. Carolyn Hoffman (see letter below) had also sent thanks to Bill for all the remembrances of Ed and for making it possible for her to attend the NSS/MIC this year.

Bill and others will attend the IEEE TAB meetings in November. Although IEEE is running in the red this year, we anticipate that our treasury will not be as severely impacted as it has been in past years. An IEEE TAB strategy workshop discussed membership, publications and open access, the latter of which Bill has discussed in detail in his report above. This may have a big impact on our income stream, but it will be a year or two until that is determined. Another issue that arose is that of hotel contracts. These are becoming more complex, negotiating favorable conditions is getting harder and, with the number of conferences and smaller workshops and other meetings organized by IEEE (over 300 per year) there is a feeling that the Institute is not using its buying power to best advantage. There is also a big difference in how US conferences and international conferences are managed. Perhaps it is time for IEEE to develop its own blanket hotel contract for all IEEE conferences. On the good news side, NPSS conferences have been growing, which has not been true for all IEEE societies.

Our Finance chair and Division IV Director, Harold Flescher, also discussed IEEE finances, income streams, and entities without income streams that use resources. Of this amount, HQ requires only about \$25m,



Albe Dawson Larsen
NPSS Secretary

Look carefully

... where we will be hearing of big things that are coming out of nanotechnology.

CNBC

Not a U-Boat

The lifeboat will right itself even after turning through 360 degrees.

Australian National Maritime Museum sign

or 12% of income. It is a lean organization, thanks to Dan Senese, the retiring manager. Society and publications costs for infrastructure have to be paid for and so do such things as salary increases, motivational bonuses, and things like the huge increase in the cost of paper. Hal notes that Open Access and membership issues will be important for the next several years. It is, with publishing changes, becoming increasingly hard to explain the value of the \$135 membership dues.

One issue brought up in discussion was that of requiring IEEE membership to allow paper presentation and publication at our conferences and in our journals. Other societies do have such policies, and perhaps TAB should evaluate this.

Much detail that was presented in the Technical Committee reports can be seen below in the reports from many of the Technical Committees, so will not be repeated here. There is also a lot of information on the IEEE NPSS web site related to the conferences. One item of note is that Particle Accelerator Science and Technology is considering the introduction of short courses with their 2007 conference that will be held in Albuquerque contiguous to the joint Plasma Sciences/Pulsed Power conference. Both will be held in the same venue with a weekend between.

Radiation Effects noted a large drop in international attendance at their 2004 conference. It is unclear whether this was due to visa issues or another factor, but visas are definitely harder to get and take more time, so it is important to get invitation letters out early and to urge people from countries where visas are required, to send in their requests early. Make sure you know who the applicants are and be very clear about issues of support!

Erik Heijne reported that the Transnational Committee still needs to be expanded, and that it should work more vigorously with the Membership committee to increase international membership. Erik also discussed the visa issues in greater detail, including problems that people with valid visas have experienced in returning to the US from visits abroad. Several technical societies are looking into this issue.

The Conference Information and Promotion Committee (CIP), formed for the 2000 NSS/MIC in Lyon, is an offshoot of the Transnational Committee and has been very active in promoting NPSS conferences through posters, and information

table at meetings, preparing participant packages, putting articles in non-NPSS journals, advertising, and so on. They are a very energetic, active group who have focused on NSS/MIC and the Real Time conference, but they just might be willing to help with other conferences.

For NPSS Conference chairs, it was again emphasized that one must be familiar with both the IEEE conference planning manual and the supplemental NPSS documents as there are very specific details about Executive Committees, publicity requirements, etc. If you are a conference chair and haven't received these documents or the links to them, contact Ray Larsen (Larsen@slac.stanford.edu) who will assist you. Conference-related organizational questions should also be addressed to Ray.

Igor Alexeff noted that getting nominations for the Society awards is hard work. Remember to send Igor (alexeff@utk.edu) nominations for the Merit, Shea and Graduate Scholar awards. See the NPSS web site for details <http://ewh.ieee.org/soc/nps/awards.htm>. The submittal deadline is May 15th and we have many colleagues deserving of these, technical committee, and IEEE awards.

Vern Price again told us the NPSS membership, although down slightly, has been fairly constant over the last 20 years, but the membership "churn" or turnover is high. Generally, those who make it through the first few years stay for the long haul.

Overall, IEEE membership is down about 6% in the last year. It is expected that by 2015 or slightly thereafter, North Americans will be 50% or less of total IEEE membership. Can you tell us why IEEE NPSS is important to you? Send me a note. We'd like to know.

By the time you receive this, the deadline for Fellow nominations will be past. However, it is none too early to think about 2006 nominations as preparation of the application takes some time. If you know of anyone who should be a Fellow, contact either Peter Winokur or Igor Alexeff to help you get the process started. Fellow candidates must be senior members of IEEE, should be nominated by another senior member, and will need letters of recommendation from a minimum of six Fellows.

This year, only TNS managed to stay close enough to its projected page count that it received a bonus from IEEE Publications. We hope that TPS, with 8 special issues in 2005,

will again be in the bonus-receiving column. We have also had a tough year for TNS in losing special edition editors. John Valentine resigned and Ed Hoffman passed away. Paul Kinahan deserves a large vote of thanks for finishing the 2003 MIC papers and for launching the 2004 effort, and John deserves equal thanks for hanging on when he was eager to step aside from his editorial duties. After much searching, and past the AdCom meeting, new editors have been found and a new editorial structure has been proposed for our journals, which is being implemented.

For anyone interested in submitting material to the Newsletter, the deadlines are April 15 for the June issue, and July 25 for the September issue. We are especially looking for articles about the technical work our members do.

Peter Clout, chair of the Communications Committee, reported that a new brochure will be released in 2005. We need to learn to take advantage of advertising opportunities, such as the 2007 confluence of three of our conferences, and we should issue press releases about our awards. If you need brochures for one of our conferences, or posters, or to use the booth, contact Peter directly (clout@vista-control.com) to request these items.

At present, according to Ron Keyser, chair of our Standards Committee, there are 10 to 12 NPSS standards that must be reaffirmed or updated. A core group of people who are both NPSS and Standards Committee members are needed for the balloting process. Contact Ron (Ron.Keyser@ortec-online.com) if this is an activity that interests you. What about the 40-year-old NIM standard? Is anyone out there still interested in it? Let Ron know.

Hal Flescher who also wears the hat of RADECS liaison, reported that there will be a RADECS workshop in the south of France in 2005, and that the 2006 meeting will be in either Greece or Sweden.

AdCom actions:

A motion was passed to allow the presentation of up to two student paper awards and two honorable mention certificates at each NPSS conference at the conference committee's discretion. Details have been submitted to TABARC for consideration and it is hoped that before you receive this, these new awards will have been sanctioned.

There were three motions related to publications:

1. AdCom endorses the proposed Editorial struc-

ture for TNS with an Editor-in-Chief, Senior Editors, and Associate Editors, for the technical areas of Radiation Instrumentation, Nuclear Medical and Imaging Sciences, Radiation Effects, and Real-Time Computer Applications, and authorizes the Editor-in-Chief of TNS to move forward with this structure.

This motion was moved, seconded and passed. To implement this, a change in the Constitution and Bylaws will be required.

2. AdCom endorses the elimination of the distinction in the editorial process between manuscripts originating from conferences and those submitted as "regular contributions." In general, the same editorial staff will handle the review process for all papers, regardless of origin. The Editor-in-Chief of TNS is authorized to move forward with implementing this change.

This motion was moved, seconded and passed.

3. Paul Dressendorfer is authorized for 2005 to allocate up to \$40,000 for administrative support to the Editorial staff of TNS.

This motion was moved, seconded, and passed, and Paul will regulate how this money is allocated and spent. He and others will also investigate the practicality or wisdom in having one person handle all administrative functions for our publications.

A motion was moved, seconded and passed to have plaques made to honor certain long-standing and active members of AdCom.

It was also moved, seconded and passed that the ad hoc committees on publications and membership would continue in 2005. The Membership Committee has, in particular, been charged with looking at how to handle member recruitment in a post-Vernon Price era since Vernon has made rumblings about stepping aside. The publications committee will finish its scrutiny of TNS and then will take a look at how TPS operates.

The next meeting of the AdCom will be:

Saturday, 12 March 2005

Sheraton Tucson Hotel and Suites

Tucson, AZ

Albe Larsen can be reached at Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park, CA 94025 USA; Phone: +1 650 926-2748; Fax: +1 650 926-5124; E-mail: amlarsen@slac.stanford.edu.

Let's hear you

Considering how foolishly people act and how pleasantly they prattle, perhaps it would be better for the world if they talked more and did less.

Somerset Maugham

CLASS OF 2008

The Newly Elected AdCom Members

Uwe Bratzler



Uwe Bratzler
Transnational
Committee

Uwe Bratzler of CERN and Tokyo Metropolitan University (TMU) is a member of the ATLAS Collaboration at CERN where he has been working on the Muon Detector Project for the last nine years. His current job function is Project Manager (for TMU at CERN).

After professional training and several years of experience working in the telecommunication field in Germany, his home country, he entered the University of Karlsruhe (Germany) where he completed his Diploma/M.S. in physics (1990) with high honors and received a Fulbright Scholarship to study in the United States. He obtained his Ph.D. in experimental particle physics from the University of Washington, Seattle, USA, in 1995. He returned to Germany to the Max-Planck Institute (MPI) in Munich to lead the development, production and testing of the first large-scale, high-precision MDT muon detector for the ATLAS project at CERN. During this time, Dr. Bratzler was elected to the MPI Institute Board. In 1998, he moved to CERN to focus on the continuing ATLAS Muon Project tasks there, and was a member of the project management team at CERN. Dr. Bratzler is a collaborator of research teams and institutions from a number of countries

around the world, such as IHEP Protvino (Russia), MIT (USA), NTU Athens (Greece) and TMU (Japan). This gives him a broad background, insight and vision concerning our international science communities, their situation and problems but also their potentials in different countries. He is author or co-author of numerous publications and has made several crucial contributions to the development of large-scale particle detector systems. In addition to these project tasks and activities, Dr. Bratzler has been working for physics education and outreach both in Europe and the USA and in the last several years for the promotion of the IEEE Nuclear Science Symposium (NSS) and Medical Imaging Conference (MIC). He has been an IEEE member for 13 years and has served on the IEEE Transnational Committee (TNC) for the last three years. He was the program chair of the 2003 IEEE NSS and is the leader of the IEEE NSS/MIC Conference Information and Promotion (CIP) team. Most recently, Dr. Bratzler was elected to the NPSS Radiation Instrumentation Steering Committee (RISC) where he will serve for the next 4 years. He has been elected to AdCom to chair the Transnational Committee and to bring international interests and concerns to AdCom.

Christopher Deeney



Christopher Deeney
Plasma Science and
Applications

Christopher Deeney was born on October 28th, 1963 in Bellshill, Scotland. In June 1984, he graduated with a First Class Honours B.Sc. in Physics from the University of Strathclyde, Glasgow. From October 1984 to October 1987, he completed his Ph.D. research on the formation of hotspots and electron beams in gas puff Z pinches and plasma focii at Imperial College in London. Dr. Deeney was a postdoctoral researcher at the University of Stuttgart, Germany until May 1988 when he joined Physics International Company, California.

At Physics International he became the program manager for Z-pinch-based plasma radi-

ation source development, for X-ray laser research and the application of pulsed corona technologies to pollution control. In 1991, he was promoted to be the Department Manager of the Plasma Physics Group.

In February 1995, Dr Deeney became the first foreign national employee of Sandia National Laboratories where he has been one of the experimenters on the 8-MA Saturn and 20-MA Z pulsed-power generators. From August 1999 to August 2000, Dr. Deeney was on detail in the Office of Inertial Confinement Fusion, where he was responsible for planning activities associated with various science campaigns, including the Nuclear Survivability Campaign, the Secondary Physics Campaign,

and the Inertial Confinement Fusion Program. In 2000, he was promoted to a department manager position at SNL with responsibilities in areas including Z-pinch development and applications of pulsed power to material dynamics studies.

To date, Dr. Deeney has published 85 journal papers on Z-pinch physics, X-ray lasers, spectroscopy, plasma focus research, X-ray diagnostics, dynamic material properties, and high repetition rate pulsed power

for pollution mitigation.

He is also an active member of the IEEE, having sat on the PSAC EXCOM and being the Chairperson for 1999 International Conference on Plasma Science, and is the chair for a Z-pinch Minicourse at ICOPS 2005 in Monterey. In 1999, he was awarded an APS Fellowship in the Division of Plasma Physics, and is a senior member of the IEEE. He has participated in many program reviews for Sandia and DOE.

Ronald J. Jaszczak

Ronald Jaszczak received his B.S. degree with High Honors in Physics from the University of Florida in 1964, ranking 4th in a class of 980. In 1968, he received his Ph.D. degree in Physics from the same university. He was awarded a U.S. Atomic Energy Commission (AEC) Post-Doctoral Fellowship at Oak Ridge National Laboratory (ORNL) and remained in its Physics Division as a Staff Physicist until 1971. He then joined the Research Department at Nuclear Chicago Corporation (now Siemens Medical Systems) as a Principal Research Scientist, and was promoted to Chief Scientist in 1977. In 1979, he was recruited to Duke University Medical Center as an Associate Professor in the Department of Radiology, and was promoted to Professor of Radiology in 1989. Currently, he is also a Professor of Biomedical Engineering at Duke.

Professor Jaszczak's research interests are in the field of medical imaging science. He has over 32 years of experience in the design and application of nuclear medical imaging systems. He has contributed to the development of single photon emission computed tomography (SPECT), and is credited with coining the term SPECT. He designed and built early prototype SPECT devices, and for the past several years his research activities have focused on advancing the quantitative imaging capabilities of emission tomography.

In 1981, he and his wife, Nancy, co-founded Data Spectrum Corporation (DSC) in Hillsborough, NC, a leading manufacturer of quality assurance and research phantoms for the nuclear medical imaging community. He has authored or co-authored over 300 peer-reviewed journal articles, conference proceedings and book chapters. Professor Jaszczak received the 2000 Paul C. Aebersold Award from the Society of Nuclear Medicine, and a 2004 Outstanding Alumni Award from the University of Florida, Gainesville.

Professor Jaszczak has been actively involved in the IEEE Nuclear and Plasma Sciences Society (NPSS) since 1975. He has held several appointed and elected positions on the NPSS Administrative Committee (AdCom) including, for example: NPSS President and Vice President, NPSS AdCom Member, NPSS Awards Chair, NPSS Nominations Committee Chair, NPSS Fellow Evaluation Committee Chair, IEEE Transactions on Medical Imaging (TMI) Steering Committee Chair, Associate Editor of TMI, Nuclear Medical and Imaging Sciences (NMIS) Technical Committee Chair, IEEE Medical Imaging Conference (MIC) Program Chair, and NSS/MIC Site Selection Committee member. In 1993, he was recognized for his contributions to nuclear medicine imaging by being elected an IEEE Fellow.



Ronald J. Jaszczak
Nuclear and Medical
Imaging Science

New Technical Committee Chairs

Jean-Pierre Martin

Computer Applications in Nuclear and Plasma Sciences



Jean-Pierre Martin

Jean-Pierre Martin obtained his Ph.D. in experimental nuclear physics in 1971, at the University of Montreal. He then worked for the University of Montreal with the responsibility of maintaining and developing the data acquisition system at the Nuclear Physics Laboratory. During that period, in the very early days of the CAMAC standard he, amongst other things, designed CAMAC branch drivers for the Laboratory. In the mid-1970s, he worked at the TRIUMF facility on rare pion decay experiments, here again contributing to the development of detectors (TPC) and DAQ systems.

In the early 1980s, he was involved in the design of the DAQ system for a gamma spectrometer facility (called the “8Pi” detector) installed at the A.E.C.L. Laboratory at Chalk River and during the same period was involved in a regional electron accelerator project and spent some time working on

beam transport issues for the Mainz electron microtron project.

At the end of the 1980s, Jean-Pierre worked at CERN commissioning the “ZED chambers” DAQ system for the OPAL collaboration, and thereafter kept it operational until the final LEP shutdown. In the 1990s, he was involved in a succession of unrelated projects, designing and building detectors and/or electronics for various research groups and industries.

He is now the associate director of the R.J.A. Levesque Laboratory at the University of Montreal and is still heavily involved in electronics, instrumentation and DAQ for many collaborations (PICASSO, ATLAS, VERITAS, KOPIO) with particular attention given to the instrumentation of the TIGRESS gamma spectrometer facility at TRIUMF/ISAC.

He is a senior member of IEEE, and chaired the NPSS Real Time Conference in May 2003.

Ilan Ben-Zvi

Particle Accelerator Science and Technology



Ilan Ben-Zvi

Ilan Ben-Zvi is a senior scientist at Brookhaven National Laboratory. He serves as the group leader for the Electron Cooling of RHIC group in the Collider-Accelerator Department. His current research interests are electron cooling of hadron beams, the generation of high-brightness electron beams, advanced electron beam diagnostics, Energy Recovery Linacs, short wavelength Free-Electron Lasers, and advanced accelerator concepts. He has developed the Superconducting Quarter Wave Resonator, the superconducting reentrant cavity and the Superconducting RFQ for heavy ion accelerators, a number of generations of the BNL photoinjector, spearheaded the measurement of slice-emittance and phase space tomography of photoinjectors, and the development of a new type of superferric undulator. He is currently developing ampere average current, high-brightness electron beam based on a superconducting photoinjector and energy recovery linac.

He is a Fellow of the American Physical Society, and a Senior Member of the Institute of Electrical and Electronic Engineers, member of the New York Academy of Science and the American Association for the Advancement of Science. He is the recipient of the 1999 IEEE Accelerator Science and Technology Award and the 2001 BNL Science and Technology Award.

Ilan Ben-Zvi received his Ph.D. in physics from the Weizmann Institute of Science, Rehovot, Israel in 1970. From 1970 to 1989 he was a member of the scientific staff of the Weizmann Institute. He held visiting positions as Research Associate at Stanford University (1970-1975), Associate Professor of Physics at the University at Stony Brook (1980-1982) and Professor of Physics at Stony Brook (1988-1990). He joined the National Synchrotron Light Source at Brookhaven National Laboratory in 1989, and the Collider Accelerator Department (joint appointment) in 2000. He is a tenured senior physicist at

BNL and an Adjunct Professor of Physics at Stony Brook. He served as the Director of the Accelerator Test Facility, a user's facility for beam physicists, from 1989 to 2004, building up the facility to serve as the premier DOE facility for advanced accelerator R&D.

His active involvement in international cooperative projects led to his design and construction of the current leads of the HERA proton ring in DESY, Germany, participation in the design and construction of the University of Washington's superconducting heavy ion booster, advisory work on beam optics, cavity design and controls of the INFN superconducting linac in Legnaro, Italy and new generation photoinjectors in collaboration with SLAC and UCLA (Gun III) and with KEK and Sumitomo (Gun IV) in Japan. In 1996 he initiated the archive of accelerator conference proceedings on the web, later to become known as JACoW. Ilan Ben-Zvi developed special relations with industry, including transfer of technology projects and collaborations on the development of novel accelerator components.

He participated in the earliest stages of the development of superconducting linear accelerators at Stanford University. His work there included SRF techniques such as UHV firing of niobium cavities; particle beam dynamics in heavy ion linacs including work on alternating phase focusing and beam dynamics of high brightness ion beams, and accelerating structures. In this field he is the co-developer of the superconducting reentrant cavity and wrote codes that explained high order multipactoring in rf cavities. In 1975 he founded the Cryogenic Technology Laboratory at the Weizmann Institute and worked there on SRF, cryogenics and electrostatic accelerators. He

developed a chopper-buncher system with emittance-independent chopper, harmonic buncher and a superconducting rebuncher and built the first quarter wave resonator superconducting booster linac. At Stony Brook he participated in the construction of its Heavy Ion Superconducting Linac, developed the Superconducting Quarter Wave Resonator, a wide-band rf cavity controller circuit and the Superconducting RFQ, all in wide use around the world. At BNL he headed the construction of the ATF Users Facility where he did research on laser and plasma acceleration, FEL physics, superferric undulators, high brightness electron guns and optical stochastic cooling. In most of these instances Ilan Ben-Zvi led teams of scientists, engineers, technicians and administrators to carry out complex R&D and construction projects.

He was a member of the editorial board of Physical Review Special Topics - Accelerators and Beams from its inauguration in 1998 until 2004. He is a member of the ICFA Panel on Advanced and Novel Accelerators. He was the elected Secretary-Treasurer of the APS Division of Physics of Beams from 1999 to 2002. From 1997 to 1999 he chaired the BNL Council. He has served on or chaired several advisory and program committees of Beam Physics conferences and workshops, (including acting as a co-chair of the 1995 International FEL Conference, Program chair of the 1999 Particle Accelerator Conference and the 2001 International FEL Conference, chair of the 2004 Advanced Accelerator Concepts Workshop etc.), technical advisory panels and reviews of accelerator and FEL projects. Since 2005 he serves as the IEEE/NPSS Particle Accelerator Science and Technology Committee chair. He is the author or co-author of over two hundred and fifty publications.

Daniel O. Jobe Plasma Science and Applications

Daniel O. Jobe attended the University of Wyoming studying Business in 1978 continuing with studies in Electronics/Instrumentation at the Technical Vocational Institute through 1981. He has completed studies in Pulsed Power, Mathematics and X-ray Diagnostics through Sandia National Laboratories in 1983-85 and 1998-99. He joined Dynallectron Corporation in 1979-80, focusing on pulsed power and instrumentation for EMP applications. In

1980, he joined Ktech Corporation under contract to Sandia National Laboratories, Albuquerque, as a specialist in Marx generator operation and development. From 1991-93 he performed research in energy loss in pulsed power switching. From 1993 through the present, his research interests have focused on Z-pinch diagnostics. He is the team leader of the Ktech Z Experimental team consisting of 50 engineers and technicians responsible for providing the Z-pinch diagnostics, target

Computer Catechism

Q: If so, what are the do's and don'ts?

A: I believe there are just don'ts. As in "don't bother trying because it don't do it."

Jim Hart



Daniel O. Jobe

development and experimental support for the Z Accelerator at Sandia National Laboratories.

Daniel Jobe is an active member of the IEEE Nuclear and Plasma Sciences Society. Beginning in 1999 at the Monterey ICOPS and continuing through the present, he has

run the IEEE Placement Center, resulting in a record number of job offerings and placements in plasma physics. In 2004 he served as Vice-Chair of the Executive Committee for the International Conference on Plasma Science.

Gerald Cooperstein Pulsed Power Science and Technology



Gerald Cooperstein

Gerald Cooperstein received both his B.S. degree in physics in 1963 and a Ph.D. degree in experimental high-energy physics in 1968 from the Massachusetts Institute of Technology.

At EG&G, Ion Physics Corporation, and, since 1971 at the Naval Research Laboratory, presently as head of the Pulsed Power Physics Branch, he has been responsible for research into the technology and applications of pulsed power science. He has co-authored over 100 publications on the subjects of high-voltage pulsed power, and intense electron and ion beam generation and applications. Dr. Cooperstein was elected a Fellow of the American Physical Society

in 1987. He was a guest editor of two special issues of the IEEE *Transactions on Plasma Science* devoted to plasma opening switches and to pulsed power science and technology. In 1992 he served as co-chairman of the 9th International Conference on High-Power Particle Beams. In 1995, Dr. Cooperstein served as technical program chairman of the 10th IEEE International Pulsed Power Conference, and in 1997 chairman of the 11th IEEE International Pulsed Power Conference, and was co-editor of the proceedings for all three conferences. The pulsed power community recognized him with the IEEE Peter Haas Pulsed Power Award in 1999.

Thoughts about Edward J. Hoffman Martin P. Tornai



Edward J. Hoffman
Late President
IEEE NPSS

I've known Ed Hoffman since 1990. I knew of him since 1989 as one of the co-inventors of Positron Emission Tomography (PET), and as a world-class scientist. So, when I started working for Ed in graduate school in 1992, he asked me if I was willing to take a risk by doing something different than PET. Not knowing any better – but thinking that he had already been at the forefront of something that seemed quite successful – I jumped right in.

A few others had toyed with similar ideas, but Ed basically helped establish a “new” field of compact molecular imaging devices. This field includes his lab’s more recent research endeavors, and also his active participation and positive influence in the medical imaging community, especially in the nuclear medical sciences. This class of technologies has even been variously mentioned in discussions about the future of Nuclear Medicine, as the ultimate direction of the field: where molecular imaging can have an immediate and direct impact on

patient care. But in these overview presentations, Ed was not always mentioned by name – he was never the star, never in the spotlight. In fact, he never sought the spotlight, since I don’t believe he needed that affirmation. He preferred to be in the lab doing research, generating discussion and ideas, or otherwise engaging students and colleagues.

He promoted and unequivocally supported the people working with him, and he did this tirelessly: for students in and even those not directly in his lab, all manner of researchers and administrators, and many professional colleagues as well. This is a testament to the fact that he was a fantastic human being who treated everyone with respect regardless of their rank.

He once told me, “Every minute that I spend working in my office, is another minute that you [his graduate students] can spend in the lab.” There was much he shielded us from, so that we really could have fun, explore, and

grow as students and individuals. He kept us from having to worry about administrative issues or academic politics. He set up a “scientific playground,” and that really seemed like a theme to his lab. He taught me that the “academic race” was truly one of pure intellectual pursuit, of discovering, inventing and just playing with ideas and instruments to help solve problems.

He always encouraged learning and self-discovery, and he had confidence in us to try to figure out questions for ourselves first. At any impasse, you could always go to him, and after listening to your explanation, he would have this clear vision to the heart of the problem, and would help open up a path to solving it.

While he was clearly woven into the fabric of the academic and scientific communities and was a world-class scientist, he was an even better mentor and friend. He always seemed to give the right advice at the right time. He once told me, “Play to your strengths.” And when he said that – even though this was a familiar adage – I somehow got this feeling he meant it in a completely supportive way, for all aspects of life. You didn’t often get pats-on-the-back from him, but his approval was unmistakable, and the drive it inspired in all of us was invigorating.

He taught to me not to worry about the little things. He taught me that most things were “little.” And, he taught me that it takes working long hours to get things done – but this means working long hours on every aspect of one’s life, including, first and foremost, family, and working in this field of molecular imaging, on which he has had such a profound impact. Of course, he also said that if we’re not enjoying these working hours, we should change them so that we are. I personally try to “work to live,” and I appreciate that Ed showed me how to take things in stride, how to balance hard work with enjoying non-working life to the fullest, and even how to make sense of it all.

“If you can survive in the hard times, you can enjoy it when times are plenty,” he once said. With his loss, we are unfortunately in one of the hard times. I am grateful for all he has given me and us, and for all the wonderful memories that we have of him that can help each of us through it.

Martin P. Tornai can be reached at the Duke University Medical Center, DUMC-3949, Durham, NC 27710-0001; Phone:+1 919 684-7940; Fax: +1 919 684-7164; E-mail:martin.tornai@duke.edu.



Martin Tornai
Duke University
School of Medicine

Open Letter to IEEE NPSS

I would like to thank everyone in AdCom and the Society for the many heartfelt condolences I've received since Ed's death July 1, 2004. I'm truly grateful for the great honor the Society has bestowed upon my husband by adding his name to the Medical Imaging Scientist Award; this will go a long way in keeping alive the memory of his many contributions to IEEE and the medical imaging field.

I am also thankful for the Society sponsoring my attendance at the 2004 NSS/MIC conference. I was warmly welcomed by many, including some I'd never met before, and it buoyed my spirits. It was also my only oppor-

tunity to see many of the friends we've both made over the years.

I continue to be amazed and awed by how many lives Ed touched and of the high opinion so many have of him. Thank you, everyone, for helping to keep him alive, at least in our memories.

My thanks also go to the NPSS, TAB and many IEEE members who have contributed to the Edward J. Hoffman Graduate Fellowship Funds.

Sincerely,
Carolyn Gray Hoffman



Carolyn G. Hoffman

I expected that

Unpredictability, too, can become monotonous.

Eric Hoffer

TECHNICAL COMMITTEES

COMPUTER APPLICATIONS in NUCLEAR and PLASMA SCIENCES TECHNICAL COMMITTEE



J. P. Martin
CANPS Chair

Computer Applications in Nuclear and Plasma Sciences (CANPS) is one of the eight major technical areas represented by NPSS. Its main purpose is to organize every two years the Real Time Conference (RTC). The most recent conferences are listed below:

- 1993: Vancouver, BC, Canada (Chair: R. Poutissou, TRIUMF)
- 1995: East Lansing, MI, USA (Chair: R. Fox, U. Michigan)
- 1997: Beane, France (Chair: P. Le Dû, CEA Saclay)
- 1999: Santa Fe, NM, USA (Chair: T. Kozlowski, Los Alamos)
- 2001: Valencia, Spain (Chair: A. Ferrer Univ of Valencia)
- 2003: Montreal, Quebec, Canada (Chair: J.P. Martin, Univ. Montreal)
- 2005: Stockholm, Sweden (Chair: R. Jacobsson, CERN)

These conferences were organized under the guidance of CANPS chairpersons R. Poutissou, TRIUMF (1992-1996), T. Kozlowski, LANL (1996-2000), Ch. Boulin, EMBL (2000-2004) and now the newly appointed chair J.P. Martin, Univ. of Montreal. The average attendance is 175 participants. Among the various NPSS conferences, its particularity is to attract a majority of non-US physicists, engineers and students. This is why the various conference venues have also been widely distributed in North America and Europe. This conference can be considered as a laboratory in which IEEE NPSS members have learned and explored the international role of IEEE NPSS in promoting overseas scientific and technical events. This was the origin of the European involvement in larger conferences such as the NSS/MIC held in Lyon in 2000 and Rome in 2004.

In order to organize these fully international conferences, and to take into account the local particularities of each non-US site (financial, logistics ...), we are experimenting in RT2005 Stockholm with a new way to manage and help the General Chair in his task by setting in place a strong team of well-trained

experts embedded in an executive committee. Later, this model could be applied to larger overseas conferences, if successful.

Concerning the program targeted for Stockholm, the Computer Applications and Real Time Data Acquisition and Analysis field has been evolving rapidly over the few past years. Starting mainly from the Nuclear and High Energy Physics Trigger and Data acquisition systems for embedded small and large accelerator experiments, we saw at the last conference in Montreal the evolution toward new exciting fields such as medical and astrophysics applications. In the same manner, both the so-called slow control, as well as on-line monitoring activities, are now fully integrated into the Real Time technologies. This evolution in the scope of the conference needs increased attention in the focus of this small, collegial and convivial event that is very well attended and supported by an international community at the edge of the state of the art of the technology. The widening of the scope can be made by approaching, for example, the medical imaging community (engineers working on front-end and digital signal processing ...). Other communities to reach will include the synchrotron radiation instrumentation people and probably the instrumentation developers in general, including the industrial sector (advanced PCI, board-based modular electronics and computing equipment...).

A new CANPS committee, now under selection, will work to bring new ideas and suggestions to the community in order to remain at the leading edge of these techniques.

Jean-Pierre Martin, the CANPS Chair, can be reached at the University of Montreal, CP 6128 Succursale Centre-Ville, Montreal, Quebec, CANADA; Phone +1 514 343-7340; Fax: +1 514 343-6215; E-mail: jpmartin@lps.umontreal.ca

Patrick Le Dû, the CANPS elected member to AdCom, can be reached at CEA Saclay, DAPNIA-SPP, 91191 Gif-sur-Yvette-Cedex, FRANCE; Phone: +33 1 6908 4073; Fax: +33 1 6908 6428; E-mail: ledu@hep.saclay.cea.fr.



Patrick LeDû
*CANPS Elected
AdCom Member*

FUSION TECHNOLOGY COMMITTEE

First Call for Papers

21st Symposium on Fusion Engineering (SOFE)

General Chair Nermin Uckan and Technical Program Committee Chair David Rasmussen recently announced the First Call for Papers for the 21st IEEE/NPSS Symposium on Fusion Engineering. The Symposium will be held at the Hilton Hotel in downtown Knoxville, Tennessee from September 26-29, 2005. The Symposium is dedicated to the scientific, technological and engineering issues of fusion energy research and is a mixture of oral presentations and poster sessions allowing for extensive interactions among the participants. Submissions in all areas of magnetic fusion energy (MFE) and inertial fusion energy (IFE) are sought, including:

- Experimental devices and new device design
- Reactor studies
- Plasma facing components
- Plasma materials interactions for IFE, MFE and alternates
- Targets for IFE and alternates
- Chambers, vacuum vessels and pumping for IFE, MFE and alternates
- Blankets and shields for IFE, MFE and alternates
- Diagnostics, data acquisition, and plasma control systems
- Safety and environmental engineering
- Heating and current drive
- Plasma fueling
- Tritium handling systems
- IFE drivers and related technologies
- Magnet engineering for IFE, MFE and alternates
- Materials assembly, fabrication, and maintenance
- Power systems
- Electromagnetics and electromechanics

Knoxville is located just outside the Great Smoky Mountains National Park and is the home of the University of Tennessee. Adjacent to the downtown area is The Old City, an area of shops, galleries, restaurants and nightspots in Victorian warehouses. Located along the Tennessee River, the Gateway Regional Visitor Center celebrates east Tennessee's natural resources and its technological (predominantly nuclear) achievements. It stands among the

fountains and foliage of Volunteer Landing, which includes riverside restaurants and riverboat tours. The Knoxville Museum of Art, in the World's Fair Park area, hosts visiting exhibits and features a small permanent collection. The Frank H. McClung Museum at Circle Park on the University of Tennessee campus, features displays on the city's archeology, art and history. The Great Smoky Mountains National Park is a 35-minute drive from Knoxville. During the Fall you can enjoy the brilliant shows of red, yellow, orange and gold which splash the mountain sides and valleys as the leaves turn the region into a brilliant bright visual wonderland. Fall is craft time in the Smokies, with special festivals throughout the nearby region. The Oak Ridge Laboratory is about a 30-minute drive from downtown Knoxville. The laboratory's major scientific programs include neutron science, energy, high performance computing, complex biological systems, advanced materials and national security. The construction of the Spallation Neutron Source will be completed in 2006 and when combined with the High Flux Isotope Reactor it will make Oak Ridge the world's foremost center for Neutron Science. Located in the city of Oak Ridge, the American Museum of Science and Energy includes exhibits on science, technology, energy, environment, national defense and historical photographs, documents and artifacts from the Manhattan Project and the construction of Oak Ridge.

The deadline for abstract submissions is April 30, 2005. For more information, please visit the SOFE web site at www.ornl.gov/fed/sofe05.

Nermin Uckan, chair of the 2005 Symposium on Fusion Engineering, can be reached at the Oak Ridge National Laboratory, P.O. Box 2008, MS6169, Oak Ridge, TN 37831-6169 USA; Phone: +1 865 574 1354; Fax: +1 865 341 8231; E-mail: uckanna@ornl.gov.

Philip Heitzenroeder, chair of the Fusion Technical Committee, can be reached at the Princeton Plasma Physics Laboratory, MS08 C-Site ENG 108, Box 451, Princeton, NJ USA; Phone: +1 609 243-2043; Fax: +1 609 243-3030; E-mail: pheitzen@pppl.gov.



Phil Heitzenroeder
*Chair of the Fusion
Technical Committee*

Wrong call

No mistake is more common and more fatuous than appealing to logic in cases which are beyond her jurisdiction.

Samuel Butler

NEWS from the NUCLEAR and MEDICAL IMAGING SCIENCES TECHNICAL COMMITTEE



Magnus Dahlbom
NMIS Technical
Committee

I would first like to thank Margaret Daube-Witherspoon, Lars Eriksson, Steven Meikle, and Charles Stearns for serving on the NMISC during the last three years. I would also like to welcome the newly elected members of the council: Roger Fulton, Christian Morel, Todd E. Peterson, Martin P. Tornai, and Charles C. Watson, who will serve from 2005 through 2007.

The NMISC held its Annual Meeting on October 21, 2004 from Noon-2 PM at the Ergife Palace Hotel, Rome, Italy. The meeting was called to order by Magnus Dahlbom, NMISC Chair.

Members present included: Magnus Dahlbom, John Aarsvold, Joel Karp, Margaret Daube-Witherspoon, Tom Lewellen, Ron Keyser, Chris Thompson, Bill Moses, Ron Jaszczak, Grant Gullberg, Sibylle Ziegler, Ron Huesman, Lars Eriksson, Paul Kinahan, Larry Zeng, Jeff Fessler, Craig Levin, Ben Tsui, Charles Stearns, Simon Cherry, Ed Lampo, Alberto Del Guerra.

The 2004 MIC meeting was dedicated by the organizers to the memory of Dr. Edward J. Hoffman, who passed away on July 1, 2004. Sibylle Ziegler (2004 MIC chair) gave a preliminary report on the 2004 MIC. She reported that 659 MIC abstracts were submitted, which was an increase of 50% compared to last year. 46 oral presentations were given at the MIC sessions, 504 posters were invited, and approximately 100 abstracts were rejected (approximately 16%). The total number of pre-registrants was 1635, which was an increase of 20% compared to last year's meeting. The final number of registrants was not available at the time of the meeting, but preliminary numbers indicate a record in attendance for the NSS/MIC meeting. Travel support was offered to approximately 65 individuals from funds obtained from 5 vendors and an NIH award.

Simon Cherry (2005 MIC chair) reported on the progress for the upcoming 2005 MIC. The abstract deadline has been set for May 2, 2005. He indicated that the meeting will be structured into morning and evening sessions, which will allow the attendees to enjoy the

resort. A grant application has been submitted to NBIB that will be used for student travel support.

John Aarsvold (2006 MIC chair) reported that the 2006 organizing committee had met at the Rome meeting and that a preconference budget was being finalized for submission to IEEE. The general chair for the meeting is Graham Smith; the NSS chair is Chuck Britton.

Ron Keyser (chair of the site selection committee) presented the proposals from the three locations (Hawaii, Las Vegas and St. Louis) considered by the 2007 site selection committee. The primary criteria used in the site selection process are: meeting space, operating costs, number/quality/cost of available rooms, travel time and availability and cost of food. The site selection committee selected, on a very close vote, Hawaii. One of the stated reasons for this was its accessibility for potential attendees from Pacific-rim countries. A vote within the NMISC concurred with the site selection committee's recommendation to pursue the holding of the 2007 NSS/MIC in Hawaii.

Ron Keyser also spoke on behalf of the 2008 site selection process. Options discussed included: having the selection committee pursue an eastern USA location; having the selection committee investigate further Las Vegas and St. Louis; and having the selection committee solicit proposals relevant to holding the 2008 NSS/MIC in Germany. A vote within the NMISC recommended the site selection committee to pursue proposals for holding the 2008 meeting in Germany. This would continue the trend of holding the meeting in Europe every 4th year.

Margaret Daube-Witherspoon, chair of the NMISC Awards/Fellows subcommittee, reported on the name change of the Medical Imaging Scientist Award to the Edward J. Hoffman Medical Imaging Scientist Award. The 2004 award recipient was Dr. Gerd Muehlllehner who was presented this prestigious award at the MIC dinner in Rome.

Craig Levin gave a brief summary of the 2004 Breast Imaging Workshop that was held in connection with the NSS/MIC. This work-

Pedal to the mental (sic!)

It is a wry
commentary on
the value system
in the United
States that one
speaks there of
"teacher training"
and "driver
education."

Peter Hilton

shop had support from the Susan G. Komen Breast Cancer Foundation, the National Cancer Institute, the National Institute of Biomedical Imaging and Bioengineering, Philips, GE, Istituto Superiore di Sanita, and the IEEE NPSS. Due to the great interest and success of this workshop, there are preliminary plans for future workshops connected with the NSS/MIC in 2006 and 2008.

The annual meeting concluded with the appointments of Jeff Fessler as the Chair of the Awards-Fellow subcommittee, who will replace Margaret Daube-Witherspoon; and Ron Huesman as the Chair of the communica-

tions subcommittee and NMISC web-master, who will replace Larry Zeng. I would like to thank Margaret and Larry for their work on these subcommittees.

Excerpted from the Minutes of the Annual Meeting and submitted by John Aarsvold, Secretary. The minutes from the meeting can be found at: <http://ewh.ieee.org/soc/nps/nmisc>.

Magnus Dahlbom, Chair of the NMISC, can be reached at the Division of Nuclear Medicine, David Geffen School of Medicine at UCLA, Los Angeles, CA 90095; Phone: +1 310 206-8273; Fax: +1 310 206-4899; E-mail: mdahlbom@mednet.ucla.edu.

RADIATION EFFECTS TECHNICAL COMMITTEE

Future NSREC Conference Plans

Janet Barth of NASA Goddard Space Flight Center is the 2006 Conference General Chairman. Janet has selected Ponte Vedra Beach, near Jacksonville, Florida, as the conference site. This location is ideal for golfers, as well as those who love beaches or historical sites. Janet has an excellent conference committee in place and we anticipate another successful NSREC.

The 2007 NSREC will be held at the Hilton Hawaiian Village Hotel in Honolulu, Hawaii. Lloyd Massengill of Vanderbilt

University, Conference General Chairman, is well along in organizing an excellent conference. This will be the first NSREC to be held in Hawaii and it will take place at the premier conference site on the island of Oahu.

The amount of lead time required to plan a conference is increasing and it currently takes more than three years to plan each NSREC. Paul Dodd of Sandia Labs is the 2008 Conference General Chair; he is currently considering sites for the conference and will host the spring meeting of the RESG at the site he proposes.

Radiation Effects Award

Nominations are currently being accepted for the 2005 IEEE Nuclear and Plasma Sciences Society (NPSS) Radiation Effects Award. The purpose of the award is to recognize individuals who have had a sustained history of outstanding and innovative technical and/or leadership contributions to the radiation effects community. The \$2000 cash award and plaque will be presented at the IEEE NSREC in

Seattle, Washington, July 11-15, 2005.

Nomination forms are available electronically at <http://www.nsrec.com/nominate.htm>. Nominations must be submitted by March 18, 2005.

Additional information can be obtained from Gary Lum, Senior Member-at-Large for the Radiation Effects Steering Group. Gary Lum can be reached at 408-756-0120.

Member at Large

Véronique Ferlet-Cavrois of the Commissariat à l'Énergie Atomique (CEA) was elected Junior-Member-at-Large of the Radiation Effects Steering Group during the annual Open Meeting at the 2004

Nuclear and Space Radiation Effects Conference (NSREC). Véronique has thirteen years of experience in research and development related to radiation effects on SOI and bulk CMOS technologies. She joined the



Teresa Farris
Radiation Effects
Publicity Chair



Véronique Ferlet-Cavrois

A dilemma

... attempts to standardize anything here results apparently in more standards, not fewer.

Richard P. Feynman

CEA, Centre de Bruyères-le-Châtel, in 1991 to work on the experimental and simulation analysis of several generations of technologies developed for military and space applications. Her field of interest also extends to the high frequency characterization and modelling of SOI devices. She is currently working on the radiation sensitivity of highly integrated 40 nm-SOI technologies with different architectures, single or multi-gate devices. Since 2001, Véronique is responsible for research programs to develop hardened circuits based on SOI

technologies for CEA systems.

Véronique graduated from l'Ecole Nationale Supérieure d'Electronique et de Radioelectricité de Grenoble (ENSERG), France in 1990. She has published more than 70 international papers, and received several awards and recognition for her work.

We welcome Véronique to the RESG!

Véronique Ferlet-Cavrois can be reached at CEA, BP-12, Bruyères, Le Châtel 91680 FRANCE; Phone +331 69264265; Fax: +331 69267115; E-mail: ferlet@bruyeres.cea.fr.

Outstanding and Meritorious Papers 2004 Nuclear and Space Radiation Effects Conference

The Awards Committee for the 2004 Nuclear and Space Radiation Effects Conference, chaired by Dave Beutler, Sandia National Labs, completed the evaluation of technical papers presented at the Conference, with the following results.

The **Outstanding Conference Paper** was given to the paper entitled:

“Production and Propagation of Single-Event Transients in High-Speed Digital Logic ICs,” by Paul E. Dodd, Marty R. Shaneyfelt, James A. Felix, and James R. Schwank (Sandia National Laboratories).

The two **Meritorious Papers** are:

Charge Enhancement Effect in NMOS Bulk Transistors Induced by Heavy Ion Irradiation—Comparison With SOI, by V. Ferlet-Cavrois (CEA/DIF), G. Vizkelethy (Sandia National Laboratories), P. Paillet, A. Torres (CEA/DIF), J. R. Schwank, M. R. Shaneyfelt (Sandia National Laboratories), J.

Baggio (CEA/DIF), J. du Port de Pontcharra and L. Tosti (CEA LETI).

Issues for Single-Event Proton Testing of SRAMs, by J. R. Schwank, P. E. Dodd, M. R. Shaneyfelt, J. A. Felix, G. L. Hash (Sandia National Laboratories), V. Ferlet-Cavrois, P. Paillet, J. Baggio (CEA/DIF), P. Tangyuyong (Sandia National Laboratories), and E. Blackmore (TRIUMF).

The NSREC Awards Committee has selected a Radiation Effects Data Workshop presentation for recognition. This year the paper selected as **Outstanding Radiation Effects Data Workshop Presentation** is:

Effect of Passivation on the Enhanced Low Dose Rate Sensitivity (ELDRS) of National LM124 Operational Amplifiers, by John E. Seiler, Gary W. Dunham, Dale G. Platteter (NAVSEA Crane), Ron L. Pease (RLP Research), Michael C. Maher (National Semiconductor Corporation), and Marty R. Shaneyfelt (Sandia National Laboratories).

RADIATION INSTRUMENTATION TECHNICAL COMMITTEE

As I start my second year as RISC Chair, I can see that 2005 promises to be an exciting one for the RITC. First, the results of last fall's election brings five new members to the RISC. The new members, whose terms started January 1, 2005, are Jim Brau, Larry Franks, Roger Gearhart, Sara Pozzi and Marek Szawlowski. We would like to congratulate the winners and welcome them to the RISC. The runners up were Renyuan Zhu and Ingrid-Maria Gregor, and we hope that they will continue to have an

interest in the RISC and consider running for election again in the future. We would also like to thank Leon Kaufman, Zane Bell, Patrick Le Dû, Marek Moszynski and Anthony Peurrung, whose terms ended on December 31, 2004, for their much appreciated service on the RISC.

Certainly the biggest event for the RITC last year was the 2004 NSS/MIC/RTSD, which was held in Rome, Italy from October 16-22, 2004. This was by far the largest NSS/MIC ever, with over 1700 attendees and



Craig Woody
Chair, Radiation
Instrumentation
Technical Committee

a very full program from both the NSS and MIC, as well as the RTSD. Alberto Del Guerra did an excellent job organizing and running this extraordinarily large meeting, and I wish to congratulate him and his Organizing Committee on their outstanding success. Please see Alberto's report in this Newsletter for additional details.

The RISC held its annual meeting in conjunction with the 2004 NSS/MIC on October 19, 2004. The main order of business was the report of the Site Selection Committee, headed by Ron Keyser, on its choice of a site for the 2007 NSS/MIC. The recommendation was for Hawaii, with St. Louis a close second. The RISC voted in favor of this recommendation, which was subsequently also approved by the NMISC, and the meeting is now destined for Hawaii in the fall of 2007. At the present time, the General Chair has not been named, but there are several worthy and willing candidates. The next order of business for the Site Selection Committee is to choose a site and a General Chair for 2008. There is considerable interest and support for hosting the meeting in Europe in 2008, particularly in Germany, and the Committee is now awaiting formal proposals from several groups regarding potential sites there. We hope to have a clear picture of how this will proceed by early spring of this year.

One of the most enjoyable events at the NSS/MIC meeting in Rome was the presentation of the RITC awards at the NSS luncheon. Two RITC awards were presented. The Outstanding Achievement Award went to Prof. Emilo Gatti from the University of Milano for his many outstanding achievements in the field of radiation detectors, and for "a career in pioneering and transcendent contributions to nuclear electronics." As many of us have known Emilio for many years as a devoted attendee of the NSS, it was particularly appropriate that he receive this award with all of his colleagues present in Rome. The second award was the Early Career Award, which went to Dr. Chiara Guazzoni, also from Milano, for "contributions to an innovative X-ray spectroscopic imager with fast frame rates and nuclear electronics." In addition, eight other young investigators were also given certificates of recognition for their achievements in the early stages of their career. It was particularly enjoyable to see our community recognize these outstanding young scientists for their excellent work.

The Outstanding Achievement Award will also be presented this year, and we would like to call for nominations for this prestigious award. The award is given in recognition of outstanding and enduring contributions to the field of radiation instrumentation. Anyone, not just an RITC member, who has made long-standing and noteworthy contributions to the field is eligible. Nomination forms can be found on the NPSS website at <http://ewh.ieee.org/soc/nps/awards.htm> which, when completed, can be sent to our Awards Committee Chairman, David Wehe at dkw@umich.edu. The nominations are due by June 1st, 2005, so please get your nominations in as soon as possible to allow time for the Committee to make its selection.

Another important way to recognize outstanding members of our Society is through the promotion of our colleagues to Senior Members and Fellows. We have many people in our Society who have made great contributions to the field of radiation instrumentation, detectors, electronics, medical imaging, and numerous other areas, as well as having performed great services to our Society as a whole. We should recognize these individuals for their achievements, and this can be done through the IEEE Senior Member and Fellows program. Information about this can be found on the IEEE website at <http://www.ieee.org/> under IEEE Awards and Fellows for the Fellows Program, and Understanding Membership for Senior Members. Please consider identifying outstanding scientists and engineers in our field (including yourself!) and promote them through these noteworthy programs.

Other news from the RISC meeting includes the appointment of Zane Bell as the new Chief Editor for Radiation Detectors for the IEEE Transactions on Nuclear Science. Zane takes over from John Valentine, who served admirably as Chief Editor for several years. We thank both John for his years of diligent service, and Zane for stepping up and taking over this important job.

Looking ahead, we should all take note of the dates of the upcoming NSS/MIC conferences. The 2005 NSS/MIC will be held at the Wyndham El Conquistador Hotel in San Juan, Puerto Rico from October 23-29, 2005. Tom Lewellen is the General Chair, and the planning for this conference is well under way. The deadline for abstract submission is May 2,

Noah said

To say we should not do that which we judge too dangerous to do is a definition of sanity.

Bill Joy

Solid foundations

Where the past exists, the future may flourish.

Peter Ackroyd

2005 and is coming up soon, so please start preparing your abstract and summaries. We expect this to be another large meeting, and a most enjoyable one at one of the top resorts in the Caribbean.

Plans for the 2006 meeting are also under way, which will be held from Oct. 29-Nov 4, 2006 at the Town and Country Resort in San Diego. Graham Smith is the General Chair of this meeting, and the first conference announcement will soon be sent out. The RTSD will also be held in conjunction with the

NSS/MIC in 2006, so we expect that this will again be a large and well attended meeting.

Finally, please don't forget that we will again be electing five new members for the RISC this year. Serving on the RISC is an excellent opportunity to get involved in the workings of our Society and to let your opinion be heard. Please consider running for the RISC if you would like to make a difference in how we do business. Nominations are due by July 1st of 2005 and can be sent to me at woody@bnl.gov or give me a call at 631-344-2752.

FUNCTIONAL COMMITTEES

Results of Awards Committee Evaluations



Igor Alexeff
Chairman, NPSS
Awards Committee

The committee received 14 award applications, and the committee chose the following 7. The applications were outstanding, and many excellent people had to lose. Please resubmit.

MERIT AWARD

Kenneth R. Prestwich
12201 Cedar Ridge, NE
Albuquerque, New Mexico, 87112

Citation – “For contributions to advance pulsed power technology of high peak power accelerators and for contributions in forming and organizing the NPSS Pulsed Power Science and Technology Committee.”

SHEA AWARD

Edward J. Lampo
Lawrence Berkeley National Laboratory
1 Cyclotron Road MS 80-101
Berkeley, CA 94720 – 0001

Citation – “For Outstanding Service to the IEEE as Treasurer of the IEEE Nuclear and Plasma Sciences Society for 12 years, including financial overseeing of the society, three journals, and numerous yearly conferences.”

EARLY ACHIEVEMENT AWARD

Robert Andrew Reed
NASA Goddard Space Flight Center,
Code 561.4

Greenbelt, MD 20771

Citation – “For contributions to measurement and modeling based solutions of particle induced damage and soft error problems in high speed microelectronic and photonic technologies for satellite applications.”

GRADUATE SCHOLARSHIP AWARDS

Hao D. Xiong
5637 Stevenson Center
EECS Dept.
Nashville, TN 37235

Vitaly Goryashko
Apt. # 42, 50A Pobeda Avenue,
Kharkiv 61202, Ukraine

Magesh Thyagarajan
Physics Department
University of Wisconsin
Madison, Wisconsin 53706

Sriram Parameswaran
1611 Laurel Ave., Apt. no. 716
Knoxville, TN 37916

Igor Alexeff can be reached at Ferris Hall 315, University of Tennessee, Middle Drive, Knoxville, TN 37996-2100; Phone: +1 865 974-5467; E-mail: alexeff@utk.edu.

REPORT from the PUBLICATIONS COMMITTEE

Annual Review of the Editorial Process

This note provides the annual review of the editorial process for the TRANSACTIONS ON NUCLEAR SCIENCE for regular contributed papers (those not associated with conferences or with our new section on nuclear medical and imaging sciences). This material also appeared as an Editorial in the February, 2005, issue of TNS, so anyone who read that note can skip this one and move on to other things.

The data presented begins with 1994. The “year” used for each data interval is from November 1 through October 31; for example, “2004” represents the twelve-month interval from November 1, 2003, through October 31, 2004.

Figure 1 shows the number of contributed papers submitted over each of the last 11 years, ranging from 67 to 113. Figure 2 shows for those manuscripts that completed the review process in a given year the percentage of manuscripts accepted for publication. As can be seen, the acceptance rate continues to remain around 50%.

Figure 3 shows the average time taken for the first review cycle for papers completing the review process in a given year. It generally takes from 6 to 8 weeks for the authors to be

sent the comments from the reviewers of their manuscript. Although reviews are typically requested from at least three reviewers, the average number of reviews sent to authors ranges from 2.4 to 2.7 (Fig. 4); approximately 10-20% of the time a reviewer does not return comments on a manuscript, resulting in this average being less than three.

Essentially all contributed manuscripts require revision in response to the reviewers’ comments. Over the last ten years, the average time for authors to submit the revised version of their manuscript after being sent the reviewers’ comments ranges from six to over fourteen weeks, as illustrated in Fig. 5. It remains interesting that on average the authors seem to take longer to respond to the reviewers’ comments than for the reviewers to perform their reviews.

When all the editorial work is completed, and the manuscript is either accepted or rejected for publication, the manuscript (in electronic format) and illustrations (usually in electronic format) are sent to IEEE for publication. Figure 6 shows that the average time from receipt of a manuscript by the Editor until its final disposi-



Paul V. Dressendofer
IEEE NPSS
Editor-in-Chief

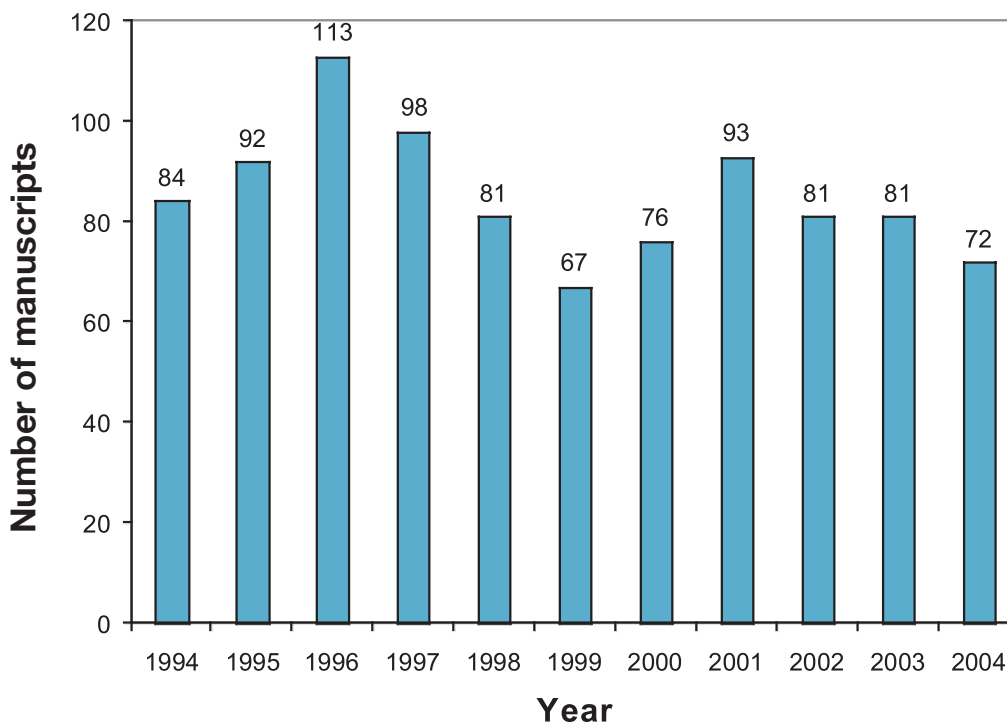


Figure 1. Number of contributed papers submitted for consideration for publication in the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

Brinkmanship

You never know what is enough unless you know what is more than enough.

William Blake

Academic attitude

If I could explain it to the average person, I wouldn't have been worth the Nobel Prize.

Richard P. Feynman

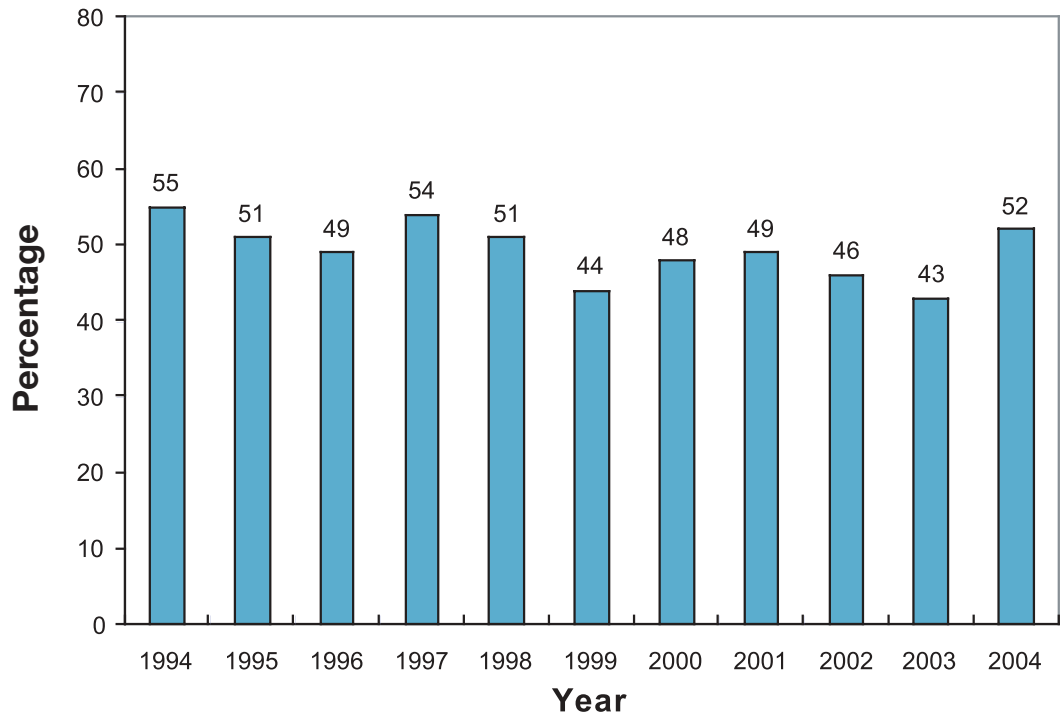


Figure 2. Percentage of contributed papers accepted for publication in the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

Modern hedonism

Ignorance of science and technology is becoming the ultimate self-indulgent luxury.

Jeremy Bernstein

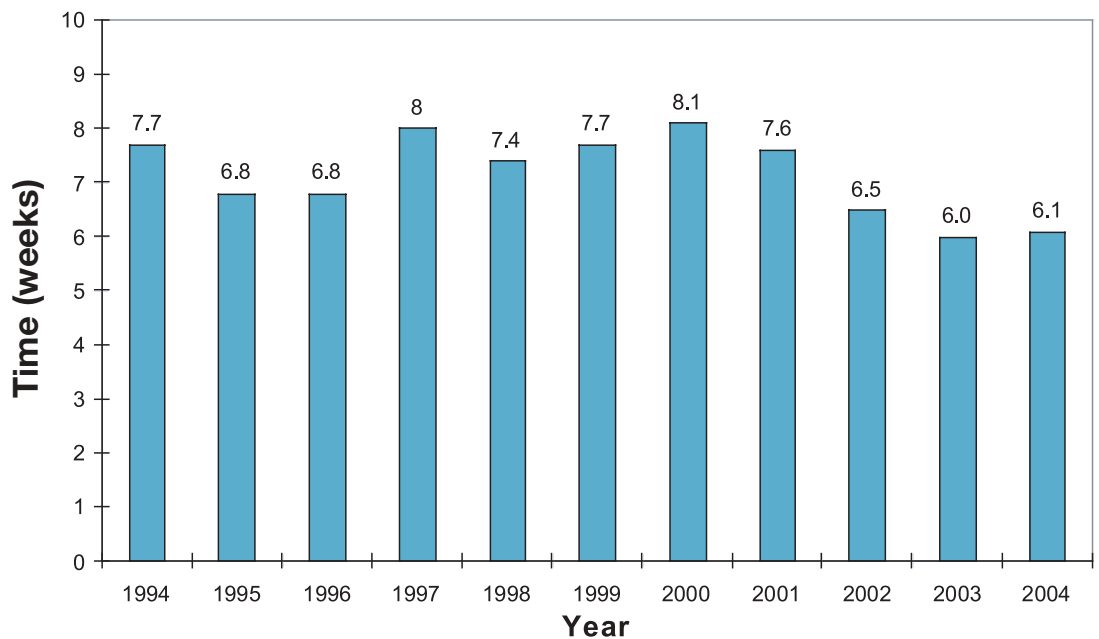


Figure 3. Average time to complete the first review and send authors the reviewers' comments for the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

tion (acceptance for publication or rejection) has ranged from 3.0 to 4.4 months over the period 1994 through 2004. In 2004 if three papers in which the authors took >4 months to return their first revision are eliminated from this average, the average time from receipt to final disposition drops to 2.3 months.

There remains additional time before an accepted manuscript appears in print. Since the TRANSACTIONS ON NUCLEAR SCIENCE is published bimonthly, on average a manuscript is delayed one month waiting for the next publication issue. IEEE schedules approximately 10 weeks to format, paginate, typeset, and otherwise prepare for printing, print, and mail the issue.

An overview of the times in the publication process is shown in Fig. 7. For each year, the average times for first review, for the authors to respond to the comments from the first review, the delay from the fact that these TRANSACTIONS are a bimonthly publication, and the time for IEEE to put together the issue is shown, along with what percentage each of these factors contributes to the overall time. This depiction is somewhat notional, since a number of manuscripts undergo a second (and sometimes a third) review cycle, and the average time for first review includes those manuscripts that are rejected (and thus do not proceed through the subsequent steps of the process). However, it does provide a

good overall picture of the contributors to and the overall time for the publication process.

The international character of the journal dominated again this year. Of the 58 papers completing the review process during this period, 11 (19%) were from the US. Asia had the most submissions with 24 (41%); Europe had 16 papers (28%). The Former Soviet Union had 3, and India/Pakistan had 4.

The average number of reviewers reporting on each manuscript has been 2.5. The reviewer pool for manuscripts draws upon the expertise of the international community; from 1994 through 2004 the proportion of international reviewers (those outside the United States) has ranged from 25% to 53% of the reviews returned. In 2004 that percentage was 47%.

If any readers have other questions about the editorial process for the TRANSACTIONS ON NUCLEAR SCIENCE, or have suggestions for improvement, please do not hesitate to contact me. Also I am continually seeking additional reviewers, so if any of you are interested in participating, please send me your name, mailing address, phone and FAX numbers, email address, and areas of interest/expertise.

Paul Dressendorfer can be reached at Sandia National Laboratories, Dept. 1116, 1515 Eubank SE, P.O. Box 5800, Albuquerque, NM 87185-1413 USA; Phone: +1 505 844-5373; Fax: +1 505 844-5470; E-mail: dressepr@sandia.gov.

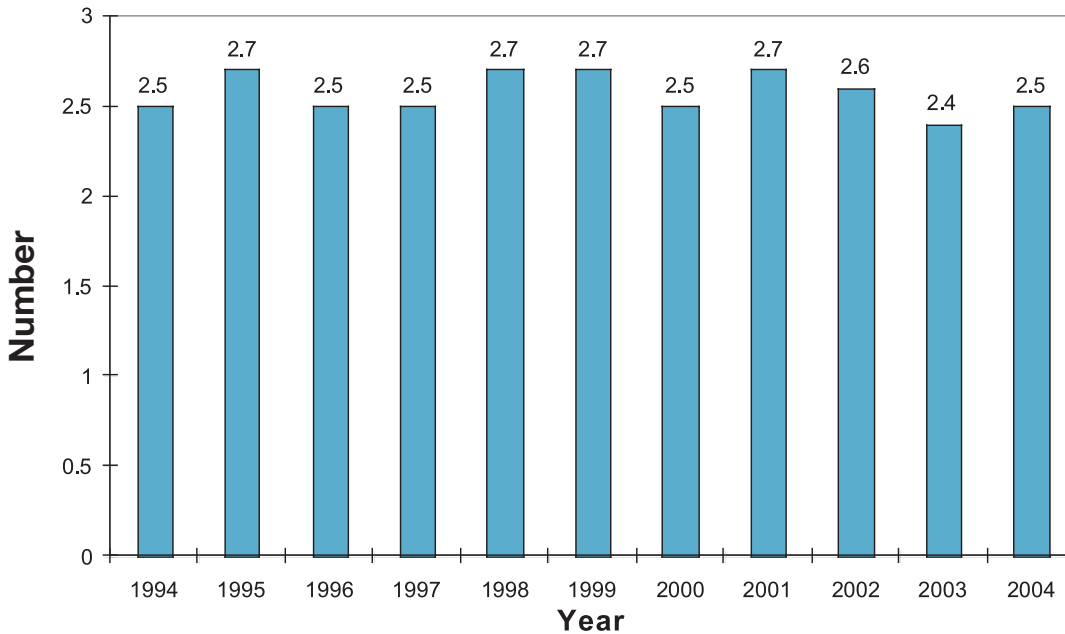


Figure 4. Average number of reviewers returning comments for each manuscript submitted to the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

E for effort

Everybody did everything else wrong, and they did it with great effort.

Stan Mazor

Matter of priority

Some agencies have a public affairs office. NASA is a public affairs office that has an agency.

John Pike

On target

A scientist's aim in a discussion with his colleagues is not to persuade, but to clarify.

Leo Szilard

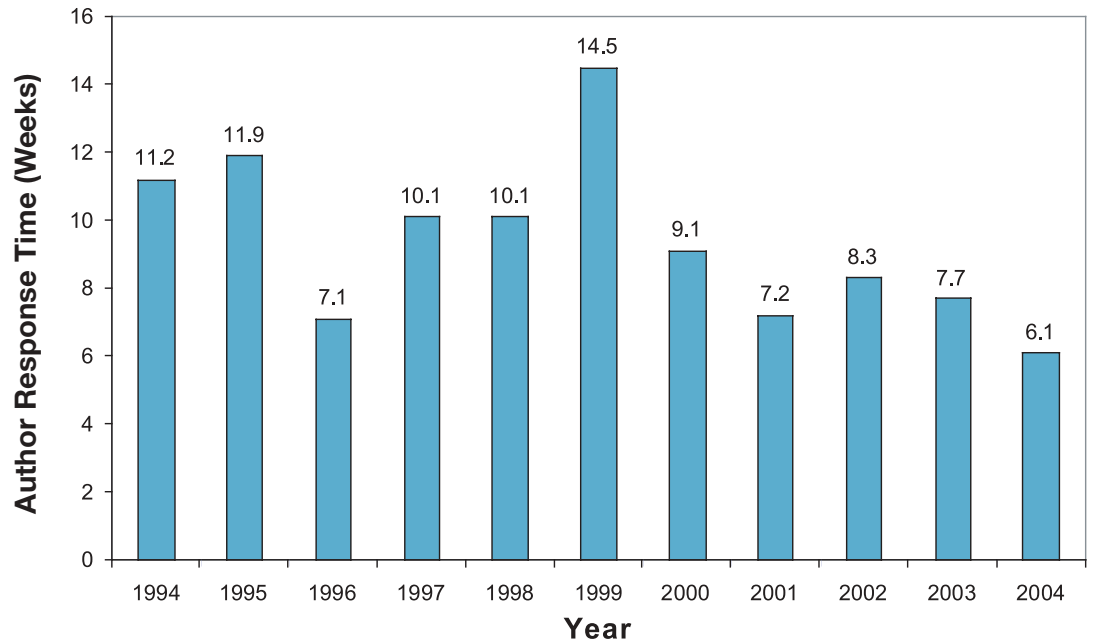


Figure 5. Average time for authors to return revised version of manuscript responding to comments from first review cycle for each manuscript submitted to the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

I see

Outside of a dog, a book is man's best friend. Inside of a dog, it's too dark to read.

Groucho Marx

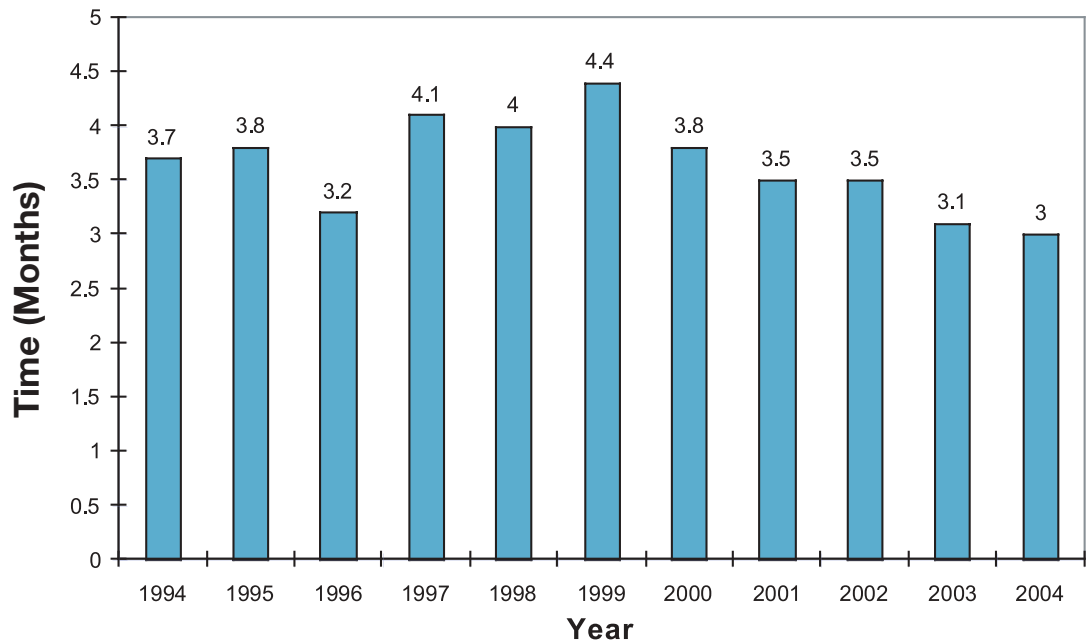


Figure 6. Average time from receipt to final disposition (acceptance or rejection) for each manuscript submitted to the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

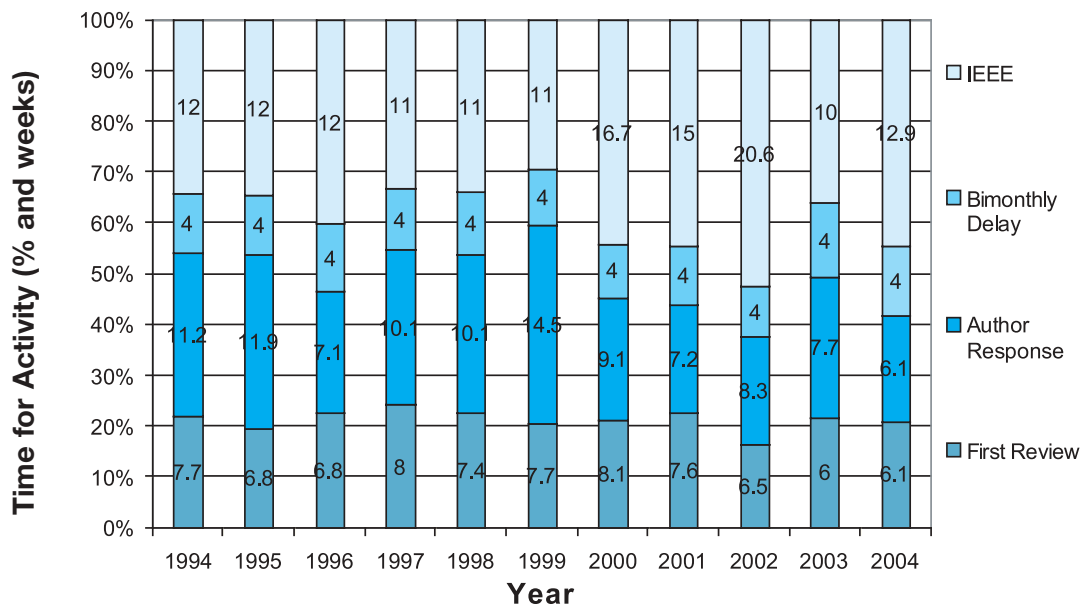


Figure 7. Average time for primary parts of publication process for each manuscript submitted to the TRANSACTIONS ON NUCLEAR SCIENCE for each year (November 1 through October 31).

Hold tight

... but in mathematics you should never give up on a good idea just because it doesn't make sense.

Ian Stewart

AWARDS

Charles Proteus Steinmetz Award

The Institute offers a number of prestigious awards for outstanding service or achievement in one's technical field and to the Institute. The 2004 Steinmetz award recipient, Julian Forster, is the first member of the Nuclear and Plasma Sciences Society to win such a Technical Field Award, given for exceptional contributions to the development of standards in electrical and

electronics engineering. Congratulations, Jay! We have had only one other recipient of an Institute award, the Emberson Service Award given in 2003 to W. Kenneth Dawson.

Surely there are more members of NPSS who are eligible for these awards. Look at the criteria and at your colleagues and let's see a whole string of these.

Julian Forster

The IEEE has named Julian "Jay" Forster, retired consultant for General Electric in San Jose, California, as the recipient of the 2004 Charles Proteus Steinmetz award. Forster has made vital contributions to the early commercialization of nuclear power while providing sustained, innovative leadership in the IEEE standards development process.

The award, presented in New York on Dec. 5, 2004, celebrates major contributions in the development of standards in the fields of elec-

trical and electronic engineering. While pursuing a career of over three decades in the growth and success of commercial nuclear power, first at the General Electric Atomic Power Division in San Jose, CA, and then at Quadrex Corporation in Campbell, CA, Jay has contributed to the development of IEEE standards, from 1969-1971 as a member of the Standards Association board, and as the leader of the team that developed the first IEEE nuclear safety standard, IEEE Standard 279 (now IEEE Standard 603), Criteria for



Jay Forster

The advantages of talent

Ordinary people can say stupid things. Brilliant people do it brilliantly.

The Atlantic Monthly

Protection Systems for Nuclear Power Generating Stations. He also initiated the writing of computer hardware and software standards, and worked to improve the Standards review and approval process.

Jay, a Life Fellow of the IEEE, belongs to the IEEE Computer Society, the Power Engineering Society and the IEEE Nuclear and Plasma Sciences Society. He has been a member of the International Electrotechnical Commission (IEC) TC-45 Standards Committee since 1969 and serves on the ANSI N-42 Standards Committee of Radiation Instrumentation. An active member of the NPSS, he is the liaison to the IEEE PACE and Standards committees and has organized, at the Nuclear Science Symposium since 1967, a Symposium on

Nuclear Power Systems, serving as its chair some 20 times. Jay has also been honored by IEEE as the recipient of the IEEE Professional Achievement Award, the IEEE Standards Board Distinguished Service Award, the IEEE Third Millennium Medal and the IEEE NPSS Richard F. Shea Distinguished Member Award.

Citation: For outstanding contributions to the development of standards in the nuclear power industry, and for sustained, innovative leadership in the IEEE Standards development process.

Jay Forster can be reached at General Electric – Nuclear Engineering M/C 344, 175 Curtner Avenue, San Jose, CA 95125; Phone: +1 408 925-5090; Fax: +1 408 925-2923; E-mail: jay.forster@gene.ge.com.

New IEEE Fellows

Each year the Board of Directors elects no more than 0.1% of the full membership to the grade of Fellow. Nominations are made by Senior Members and must be supported by at least six Fellows. After being reviewed and ranked by the appropriate IEEE Society, the nominations are

forwarded to the Fellows Committee of the Board who then recommend a list of candidates for the Board's consideration. The NPSS is pleased that the following members were elected by the Board this year, and extends its congratulations to all of them.

Robert Christopher Baumann



Robert Baumann

Robert Baumann received the B.A. (1984) with honors in physics from Bowdoin College and the Ph.D. (1990) in electrical engineering from Rice University, researching ferroelectric process development and integration for opto-electronic applications. He joined Texas Instruments in 1989 where he made significant contributions to the understanding of alpha and neutron effects including the discovery that activation of 10B in BPSG by low energy neutrons is a significant source of soft errors in advanced technologies. Most of the semiconductor industry has since followed suit, eliminating BPSG from advanced technologies. He is currently a Distinguished Member of the Technical Staff, focused on radiation effects in advanced SRAM and logic

devices. Robert was one of the primary authors of the International JEDEC JESD-89 specification that has become the defacto industry standard for radiation effects testing of commercial electronics. Robert is co-chairing an SIA experts panel on radiation effects regarding the International Traffic in Arms Regulations (ITAR) and its potential for inadvertently capturing commercial technologies. Robert was recently elected to Fellow of the IEEE “**For contributions to the understanding of the reliability impact of terrestrial radiation mechanisms in commercial electronics.**”

Dr. Baumann can be reached at 13560 N. Central Expressway, MS3737, Dallas, TX 75243-1108 USA; Phone: +1 972 995-1432; Fax: +1 972 995-2770; E-mail: rbaum@ti.com.

Shu T. Lai



Shu T. Lai

Shu T. Lai, a senior physicist in the Space Weather Center of Excellence, Space Vehicles Directorate, Air Force Research Laboratory (AFRL), Hanscom Air Force Base, Massachusetts, is a recognized leader in spacecraft interactions with space plasmas. This area is important to space science and engineering,

systems, and missions. He was previously with the Massachusetts Institute of Technology Lincoln Laboratory.

With his theoretical formulations and data analysis of spacecraft environmental interactions, Dr. Lai has contributed significantly to the maturation of spacecraft charging from

its infancy in the late 1970s into its current state as a well-developed aerospace subject that impacts spacecraft design, space experiments, space electronics and spacecraft survivability. Dr. Lai's more than eighty publications, including three patents, communicate important advances in understanding the process of spacecraft surface charging, deep dielectric charging, mitigation techniques, critical velocity ionization in the vicinity of spacecraft, and hypervelocity impacts on spacecraft.

Dr. Lai received his Ph.D. in Physics from Brandeis University, Waltham, MA, 1971 and the Certificate of Special Studies in Administration and Management from Harvard University, Cambridge, MA, 1986. He was the leading guest editor of IEEE Transactions on Plasma Science, Special Issue on Space Plasmas, Dec 2000. He was the Chair of the IEEE Nuclear and Plasma Sciences Chapter, IEEE New England Section,

1993-1996. He has chaired numerous sessions in conferences of IEEE, American Institute of Aeronautics and Astronautics (AIAA), American Geophysical Union (AGU), American Physical Society (APS), and in Spacecraft Charging Technology Conferences. He also served as the Chair of the AIAA Atmospheric and Space Environments Standards Committee, 1996-2002, and the Chair of the AIAA Atmospheric and Space Environments Technical Committee, Jan 2003-Jan 2005. In addition to his election to IEEE Fellow, Dr. Lai is also a Fellow of the Institute of Physics, a Fellow of the Royal Astronomical Society, and an Associate Fellow of AIAA.

Citation: for contributions to spacecraft interactions with space plasmas.

Dr. Lai can be reached at: Air Force Research Laboratory, Mail stop: VSBXT, 29 Randolph Road, Hanscom AFB MA 01731-3030; Phone: +1 781 377-2932; Fax: +1 781 377-3010; E-mail: shu.lai@hanscom.af.mil.

Irvin Raymond Lindemuth

Irvin Lindemuth retired from full-time employment in November 2003 after more than 32 years with the University of California, first at the Lawrence Livermore National Laboratory and then at the Los Alamos National Laboratory. At Los Alamos at the time of his retirement, Dr. Lindemuth was a Special Assistant for Russian Collaboration in the Office of the Associate Director for Weapons Physics, the Team Leader for Magnetohydrodynamics and Pulsed Power in the Plasma Physics Group, and a Project Leader for Pulsed Power Science, Technology, and International Collaboration in the High Energy Density Hydrodynamics Program. His primary responsibility was to provide technical leadership for a scientific collaboration between Los Alamos and Los Alamos' Russian counterpart, the All-Russian Scientific Research Institute of Experimental Physics (VNIIEF) at Sarov (Arzamas-16). Prior to joining Los Alamos in 1978, he was a technical staff member in A-Division at the Lawrence Livermore National Laboratory where he was involved in fusion research. Dr. Lindemuth received his B.S. degree in Electrical Engineering from Lehigh University in 1965 and his M.S. and Ph.D.

degrees in Engineering--Applied Science from the University of California, Davis/Livermore in 1967 and 1971, respectively. His thesis research was conducted under the direction of Dr. John Killeen, founder of the National Magnetic Fusion Energy Computer Center. He has been an Adjunct Professor at the University of New Mexico Los Alamos branch, where he has taught engineering and mathematics courses. He spent the 1991-92 academic year as a Visiting Professor in the Nuclear Engineering Department of Texas A&M University, where he taught undergraduate and graduate courses, helped lay the groundwork for the Department's expansion into the controlled fusion area, and assisted the Department in forming collaborations with Russian laboratories and educational institutions. His areas of expertise include thermonuclear fusion and advanced numerical methods for the computer simulation of fusion plasmas and related pulsed power technology. He has published numerous papers in refereed journals and proceedings of major international conferences. He has been involved in a wide range of fusion and high energy density physics programs spanning essentially all of the ten orders of mag-

**Quick Jeeves,
the zits!**

**Retirement at 65
is ridiculous.
When I was 65, I
still had pimples.**

George Burns



**Irvin Raymond
Lindemuth**

Write on!

Scientific journalism is too important to be left to journalists.

Richard Dawkins

nitude in density and time space from magnetic fusion energy plasmas to inertial confinement fusion plasmas. An internationally recognized pioneer in the application of implicit, non-split computational methods to magnetohydrodynamics, he has achieved widespread recognition for his large-scale numerical simulations of a variety of fusion and other high-density plasma systems. In addition to his accomplishments in modeling high temperature plasmas, he has formulated a variety of novel pulsed power computer codes that have led to important advances in laboratory programs. His codes have stimulated the development of several types of fast opening switches. He is a US pioneer in Magnetized Target Fusion (MTF) and performed the first comprehensive survey of the parameter space in which MTF was likely to work. Even before the collapse of the Soviet Union, he recognized that the Soviets had developed advanced technology in the areas of ultrahigh magnetic fields and ultrahigh energy electrical pulse generation that signif-

icantly exceeded US capabilities and that were motivated by the Soviet MTF program known as MAGO. Dr. Lindemuth played an essential role in establishing the collaboration with VNIIEF, a collaboration that has helped integrate Russian weapons scientists into the global scientific community and has resulted in more than 250 conference papers and archival publications. The LANL/VNIIEF collaboration, and Dr. Lindemuth's role in it, were featured in the Discovery Channel documentary, "Stockpile," first aired in 2001. In 1992, Dr. Lindemuth was the recipient of a Los Alamos Distinguished Performance Award for his work in the formative stages of the LANL/VNIIEF collaboration. Dr. Lindemuth is currently associated with the faculty of the Physics Department of the University of Nevada at Reno.

Citation: For contributions to magnetized plasma and related pulse power technology.

Dr. Lindemuth can be reached at 2490 N. Grannen Road, Tucson, AZ 85745 USA; E-mail: irvl@att.net

Yitzhak Maron



Yitzhak Maron

Yitzhak Maron received the Ph.D. degree in Physics from the Weizmann Institute of Science, Israel, in 1977.

From 1980 to 1984, he worked at the Laboratory of Plasma Studies, Cornell University, Ithaca, N.Y. Since 1988, he has been a Professor of Physics and the Head of the Plasma Laboratory, Faculty of Physics, Weizmann Institute of Science. His Laboratory specializes in the development of spectroscopic diagnostic methods for investigation of the properties of plasmas and of the electric-magnetic fields in pulsed-power systems, as well as in developing atomic physics

models required for the interpretation of data from hot and dense plasmas. His research encompasses electron and ion diodes, plasma switches, and Z-pinchs, including collaborations with various Universities and Institutions in the USA and Europe.

Prof. Maron is also a Fellow of the American Physical Society.

Citation: For contributions to spectroscopic techniques for diagnosing high-current, high-voltage electric and magnetic properties.

Dr. Maron can be reached at the Weizmann Institute of Science, Rehovot, 76100 ISRAEL; E-mail: Yitzhak.Maron@weizmann.ac.il

Lloyd Wilson Massengill



Lloyd Wilson Massengill

Lloyd W. Massengill is professor of Electrical and Computer Engineering at Vanderbilt University in Nashville, TN where his primary teaching responsibilities include microelectronic circuit analysis and design. His research focuses on radiation-effects modeling and integrated-circuit functional analysis for mission-critical space and strategic systems.

During his career, he has pursued research efforts in the study of integrated circuit faults arising from single-event and dose-rate radia-

tion, the development of specialized circuit analysis techniques, and the development of radiation hardened circuitry. In particular, recent studies include single event (soft error) charge collection processes in submicron CMOS devices, terrestrial radiation effects in emerging low power technologies, single-ion-induced failures in very thin (<5 nm) gate oxide stacks, and soft error effects in combinational logic. He presently has programs in the analysis of analog and digital single-event transient effects, the assessment of radiation hard-

ened-by-design techniques, and EDA tool development for space/strategic circuit design.

Prof. Massengill has served as the Associate Chair of the Vanderbilt Electrical Engineering and Computer Science Department and now serves as the Engineering Director of the Vanderbilt Institute for Space and Defense Electronics, a professional center providing engineering support for mission-critical and fault-tolerant microelectronic circuit design.

Akira Mizuno

Akira Mizuno (M'84-SM'97) was born in Aichi, Japan, in 1951. He received the B.S. degree from Nagoya University, Nagoya, Japan, and the M.S. and Ph.D. degrees from the University of Tokyo, Tokyo, Japan in 1973, 1975, and 1978, respectively, all in electrical engineering.

He was with Ishikawajima-harima Heavy Industries Company, Ltd., between 1978-1981. Since April 1981, he has been with Toyohashi University of Technology, Aichi, Japan, where he is currently a Professor of Ecological Engineering. From December 1982-April 1984, he was a visiting research fellow in the Department of Physics, Florida State University, Tallahassee, where he was engaged in a project involving electron beam charging and precipitation of aerosol and industrial dusts. From May – August 1999, he was a visiting professor at the University of Poitiers, France. Between April 2001 and March 2004, he was concurrently a professor in the Dept. of Electrical Engineering, University of Tokyo. Between April 2003 and March 2004, he was a professor at the Institute of Molecular Sciences, Okazaki National Institutes, Okazaki, Aichi, Japan.

He has contributed significantly to the application of nonthermal plasmas in environmental protection, especially in decomposition of gaseous pollutants. Prof. Mizuno and his research group have developed an original and energy-efficient gas cleaning process by combining a catalyst with a nonthermal plasma produced by pulsed discharge or packed bed discharge. Recently, these nonthermal plasma processes have been widely used in air conditioner and air cleaning equipment. One of his inventions is the combination of pulsed discharge plasma with a TiO₂ catalyst. Initially, a Korean company jointly developed this system for air conditioners. Since its introduction to the market, this company has

Education: PhD EE 1987, MSEE 1984, BSEE 1982, North Carolina State University.

Citation: For contributions to radiation effects in microelectronics.

Prof. Massengill can be reached at Vanderbilt University, VU Station B 350069, Dept. of Electrical Engineering and Computer Science, Nashville, TN 27235-0069; Phone: +1 615 343 6677; Fax: +1 615 343-6614; E-mail: lloyd.massengill@vanderbilt.edu.

produced over 1 million units per year. Prof. Mizuno also contributed to the development of an indoor air cleaner, together with a Japanese company. After commercialization, the nonthermal plasma process has been widely accepted as an important method for improving the quality of air. Prof. Mizuno has been actively involved in various applications using nonthermal plasma processes: (1) development of an efficient diesel exhaust gas cleaning device using the plasma-catalyst combination, (2) sterilization using oxygen radicals produced by nonthermal plasma, (3) conversion of oil and hydrocarbons into methanol or hydrogen.

He has published over 100 reviewed papers in archival journals, and about 150 papers in international conference proceedings.

He supervised 10 PhD and 60 MSc dissertations, and currently is supervising 6 PhD students. He has acted as an external examiner for over 10 PhD theses.

Prof. Mizuno has not only made contributions in nonthermal plasma processes, but also contributed to development of the field of application of electrostatics such as particle charging by electron beam, electrostatic precipitation, electrical sterilization, weed control by electrical discharge, and manipulation of fine particles including individual cells and DNA molecules using electrostatic force and laser optical force. His method of using laser manipulation with bead-clustering has provided a simple and reliable way to handle single molecules.

He actively participates in IEEE, Institute of Electrostatics Japan, and is a member of the American Chemical Society, Institute of Electrical Engineers Japan, Japanese Applied Physics Society, and other professional societies.

Citation: For the reduction of gaseous pollutants.



Akira Mizuno

Quiet please!

The right word may be effective, but no word was ever as effective as a rightly timed pause.

Mark Twain

Akira Mizuno can be reached at: Department of Ecological Engineering, Toyohashi University of Technology, 1-1 Hibariga-Oka, Tempaku-Cho,

TOYOHASHI-AICHI 441-8580 JAPAN; Phone: +532 44 6904; Fax: +532 44 6929; E-mail:mizuno@eco.tut.ac.jp.

Stanley O. Schriber



Stanley O. Schriber

Stan Schriber is an elder statesman of the Particle Accelerator Science and Technology Community within the Nuclear and Plasma Sciences Society of the IEEE. His contributions span engineering/scientific achievements, technical leadership and now education with his recent return to academia at Michigan State University (MSU).

More than 30 years of designing and developing linear accelerators has made physicist Schriber more than qualified to be selected an IEEE fellow. The MSU professor of physics and astronomy, who has an appointment in MSU's National Superconducting Cyclotron Laboratory (NSCL), becomes one of a handful of researchers to earn this honor.

"This recognition not only honors me, but the entire team at the NSCL," Schriber said. "This is a team that truly understands linear accelerators. And we have one of the best teams in the world doing experimental work using the coupled cyclotron."

Schriber and his colleagues hope to apply their state-of-the-art work on linear accelerators to the Department of Energy's (DOE) Rare Isotope Accelerator (RIA) project, for which MSU is competing. RIA is a soon-to-be-built \$1 billion nuclear science research facility. The DOE, funding agency for the project, has yet to decide where the facility will be located. MSU and Argonne National Laboratory in Illinois are the main competitors.

Schriber received his Ph.D. in nuclear physics from McMaster University in 1967. He has been at MSU since April 2003. Prior

to that he spent nineteen years at the Los Alamos National Laboratory in senior management where, for most of that time, he led the Accelerator Technology division.

Prior to that he was at the Chalk River Nuclear Laboratories where he served in a number of capacities. While there, he was internationally recognized for his expertise in the development of rf (radio frequency) coupled-cavity linear structures and continuous-wave accelerators. He invented improved versions of such linear accelerator structures, investigated their properties analytically, supervised their construction and used them in a number of system applications.

He has been actively involved in IEEE and American Physical Society (APS) affairs, helping on committees and councils. He served on organizing committees for EPAC, PAC, and LAC, was the 1995 PAC conference chair in Dallas, and will chair the 2007 PAC conference in Albuquerque. Stan is chair of the US Particle Accelerator School program committee that determines possible courses and instructors for future schools.

In addition to this IEEE honor, Schriber is a fellow of the APS, has published more than 130 scholarly papers, and is the holder of eight patents.

Citation: For contributions to linear accelerator technology.

Stan Schriber can be reached at Michigan State University, Cyclotron Bldg NSCL, Room 100B, East Lansing, MI 48824-1020 USA; Phone: +1 517 333-6352; Fax: +1 517 353-5967 E-mail: schriber@nscl.msu.edu.

Bruce Paul Strauss



Bruce Paul Strauss

Bruce Strauss is presently the Program Manager for the United States Department of Energy's \$210 million contribution to the LHC Accelerator Project. He serves on the DOE/NSF Joint Oversight Group (JOG) for U.S. LHC activities. He chairs the CERN review committee regarding procurement of superconductor and superconducting magnets for the LHC. As a member of the Advanced Technology R&D branch of the Office of High Energy Physics at DOE, he is

responsible for all of their superconductivity development university grants and laboratory activities. He serves as Executive Secretary to the High Energy Physics Advisory Panel (HEPAP) of the Department of Energy and the National Science Foundation.

He received his undergraduate and doctoral education at the Massachusetts Institute of Technology and a Master of Business Administration degree at the University of Chicago.

Following early experience at the AVCO Everett Research Laboratory and at Argonne National Laboratory, he joined the Fermi National Accelerator Laboratory in Batavia, Illinois. At Fermilab, he rose to the rank of Assistant Director of the Tevatron Project. He was responsible for the procurement scheme for the entire superconductor inventory for that project.

He left Fermilab to join the Magnetic Corporation of America where he served as production manager for superconducting wire and magnet fabrication. Subsequently he was the principal of two management-consulting organizations. Clients included government agencies, national laboratories and industrial concerns. A significant consulting contribution was to the Management and Administration Branch of the DOE for the Independent Cost

Estimation (ICE) process for all of the technical components, installation and commissioning for the Superconducting Super Collider.

Dr. Strauss is an incorporator of the Applied Superconductivity Conference, Inc. where he presently serves as the corporate treasurer as well as a member of several technical committees. He is also treasurer of the IEEE Technical Council on Superconductivity.

Citation: For leadership in low temperature superconducting materials and magnet systems.

Bruce Strauss can be reached at the United States Department of Energy, 1000 Independence Ave SW, SC-224/Germantown, Washington, DC 20585-1290 USA; Phone: +1 301 903-3705; Fax: +1 301 903-2597; E-mail: bruce.strauss@science.doe.gov.

Benjamin M. W. Tsui

Benjamin M. W. Tsui received his B.S. and A.M. degrees in Physics from the Chinese University of Hong Kong in 1970 and Dartmouth College in 1972, respectively, and his Ph.D. degree in Medical Physics from the University of Chicago in 1977. He was a Postdoctoral Fellow (1977-1979) and an Assistant Professor (1979-1982) of Radiology at the University of Chicago. He then worked as a Research Associate Professor (1982-1987), an Associate Professor (1987-1992) and a Professor (1992-2002) of Biomedical Engineering and Radiology at the University of North Carolina at Chapel Hill. He is currently a Professor of Radiology, Electrical and Computer Engineering, Biomedical Engineering and Environment Health Sciences (2002-present) at the Johns Hopkins University.

Professor Tsui is cited for his contributions to nuclear medicine imaging, especially in single photon emission computed tomography (SPECT). He is noted for the development of SPECT instrumentation, image reconstruction techniques, quantitative SPECT methods, and image quality assessment, and for the education of graduate students and postdoctoral fellows. His research interests include imaging physics, instrumentation, computer phantoms, Monte Carlo simulations, image reconstruction methods, and image evaluation using mathematical and human observers. He is the author and co-author of over 200 publications and the principal investigator of 5 NIH and DOD research grants and several industrial

research contracts. He is the principal advisor of over 30 M.S. and Ph.D. past and current students and 10 postdoctoral research fellows.

Prior to becoming a Fellow of the IEEE, Professor Tsui was elected a Fellow of the American Institute for Medical and Biological Engineering (AIMBE), a Fellow and Chartered Physicist of the Institute of Physics (IOP), and a member of several other professional organizations and societies. He has served as a member of many scientific review committees for various federal agencies, including the NIH, NSF, DOE and DOD, state agencies and private foundations. Also, he has been a regular reviewer and a member of the editorial boards of several scientific journals. In addition, Professor Tsui has been an active member of the Nuclear Medical Imaging Sciences Technical Committee (NMIST) of the IEEE Nuclear and Plasma Sciences Society (NPSS) for many years and was the program chair of the Medical Imaging Conference (MIC) for the 2001 Nuclear Science Symposium (NPS) and Medical Imaging Conference (MIC). He now represents NPSS in a liaison capacity to a committee of IEEE-USA.

Citation: For contributions to nuclear medical imaging, especially in single photon emission computed tomography.

Ben Tsui can be reached at Johns Hopkins University, JOHC4263, 601 North Caroline Street, Baltimore, MD 21287-0859 USA; Phone: +1 443 287-4025; Fax: +1 410 614-1977; E-mail: btsui1@jhmi.edu.



Benjamin M. W. Tsui

SOCIETY AWARDS

Graduate Scholar Awards

Magesh Thiyagarajan



Magesh Thiyagarajan

Magesh Thiyagarajan was born in Chennai, India. He received the Bachelor of Engineering degree in Electrical and Electronics Engineering from the University of Madras, India in 2001. He received the prestigious Medal of Honor from the University of Madras for excellence in academic work during his undergraduate studies.

Mr. Thiyagarajan has recently completed the M.S degree in Electrical Engineering with a concentration on Plasma Engineering in May 2004 from the Department of Electrical and Computer Engineering at the University of Tennessee, Knoxville. There he was a Graduate Research Assistant in the Microwave and Plasma Laboratory, under the direction of Professor Igor Alexeff. His thesis work was on the Atmospheric Pressure Resistive Barrier Plasma Discharge for Biological Decontamination and Sterilization of Micro-organisms. This system allows the use of plasmas to kill bacteria, viruses and spores. The device works well, and is patented, licensed, and is generating royalties. He has designed a diagnostic Method of Ion Current Measurement in the Atmospheric Pressure DC Discharge that rejects plasma electrical noise. He was also actively involved in

other research projects such as Experimental Ball Lightning, Plasma Stealth Antennas, MHDs and Plasma Thrusters.

Mr. Thiyagarajan has authored and co-authored nine archival papers in journals and conference proceedings in his area of research. He has been awarded the prestigious University of Tennessee Citation Award for Extraordinary Professional Promise for the year 2004. Mr. Thiyagarajan is a member of the honor societies Tau Beta Pi, Eta Kappa Nu, Order of the Engineer. He is a student member of the IEEE.

Mr. Thiyagarajan is currently concentrating on his Ph.D. dissertation research topic — developing a large volume laser initiated and radiofrequency sustained high pressure inductively coupled plasma source, at the University of Wisconsin – Madison.

He was nominated for this award by Professor Emeritus Igor Alexeff of the University of Tennessee at Knoxville.

Magesh Thiyagarajan can be reached at the Center for Plasma Theory and Computation, University of Wisconsin – Madison, 1500 Engineering Dr., Madison, WI 53706-1609; Phone: +1 608 658-4542; E-mail: tmagesh@ieee.org.

OTHER AWARDS

George H. Miley

2004 ANS Radiation Science and Technology Award



George H. Miley

The American Nuclear Society, in recognition of the expanding contributions radiation sciences make to industrial progress, established the Radiation Science and Technology Award in 1967. The purpose of the award is to identify and honor those individuals whose creative application of radiation sciences and engineering principles have been particularly outstanding.

The 2004 Award was presented to Prof. George H. Miley, Department of Nuclear, Plasma and Radiological Engineering at the University of Illinois at an Honors and Awards Luncheon in Washington DC, November 16, 2004.

Citation: For his creative contributions

to radiation science and technology in furthering the development of nuclear batteries, nuclear pumped lasers, and small fusion-based neutron sources for industrial neutron activation analysis.

George Miley can be reached at the Fusion Studies Laboratory, University of Illinois, 100 NEL, 103 S. Goodwin Ave, Urbana, IL 61801-2901; Phone: +1 217 333-3772; Fax: +1 217 333-2906; E-mail: ghmiley@uiuc.edu.

Ed. Note: *The above is included to let our membership know of an important award bestowed by another society on a long-standing and active member of the Nuclear and Plasma Sciences Society. Congratulations, George!*

Ronald J. Jaszczak University of Florida Outstanding Alumni Award

Ronald Jaszczak has been recognized with an Outstanding Alumni Award by the College of Liberal Arts and Sciences at the University of Florida. He received this honor at the University's Annual Awards Brunch held on November 13, 2004 in conjunction with the University's Homecoming activities in Gainesville, Florida.

Dr. Jaszczak earned a Bachelor's Degree in Physics from the University of Florida in 1964, ranking fourth in a class of 980; he earned a PhD in Physics in 1968 from the same university. Over the course of his career, he has worked in academia, private industry and at the US Atomic Energy Commission's Oak Ridge National Laboratory (ORNL). He held appointments at ORNL and the Nuclear Chicago Corporation (now Siemens Medical Solutions) until being recruited by Duke University in 1979; since that time, he has been a Professor of Radiology and Biomedical Engineering at Duke.

His research interests are in the field of medical imaging science. He has made major contributions to nuclear medicine, in particular to the development, characterization and understanding of single photon emission computed tomography (SPECT). In 1981, he and his wife, Nancy, co-founded Data Spectrum Corporation (DSC) located in Hillsborough, North Carolina. DSC is a leading manufacturer of quality assurance and research phantoms for the nuclear medical imaging community.

Dr. Jaszczak is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and has served the Nuclear and Plasma Sciences Society in many administrative capacities, including NPSS President from 1997-1998. In recognition of his pioneering work in nuclear medicine imaging, the Society of Nuclear Medicine honored Dr. Jaszczak with the 2000 Paul C. Aebersold Award.



Ron Jaszczak Receives Outstanding Alumni Award

**Drink deep or
taste not...**

**Only the man
who knows too
little knows too
much.**

Rex Stout

Occupation

**A learned man is
an idler who kills
time with study.**

*George Bernard
Shaw*

Call for Award Nominations for 2005



Igor Alexeff
Awards Committee
Chairman

Clean sweep

... if there's one thing I have learned in politics, it's never to turn your back on a crumb.

*Hubert
Humphrey*

The time is NOW for nominating your well – deserving colleagues for the IEEE Nuclear and Plasma Sciences Society and Committee awards. If you have any questions, E-mail or call me. The deadline for nominations is May 15, 2005.

The NPSS Awards comprise the following.

THE RICHARD F. SHEA DISTINGUISHED MEMBER AWARD.

Description: To recognize outstanding contributions through leadership and service to the NPSS and to the fields of Nuclear and Plasma Sciences.

Prize: \$2,000, Plaque, and Certificate.

Funding: Funded by the IEEE Nuclear and Plasma Sciences Society.

Eligibility: Any member of the IEEE and NPSS who has contributed to the fields of nuclear and plasma sciences through leadership and service.

Basis for Judging: Selection criteria are:

- Leadership roles and leadership quality;
- Innovative and important contributions to Society activities;
- Service and dedication to the NPSS;
- Technical achievements.

Presentation: One award presented annually at Nuclear Science Symposium (Or at any other IEEE NPSS meeting that the awardee chooses.)

THE NPSS MERIT AWARD

Description: To recognize outstanding technical contributions to the fields of Nuclear and Plasma Sciences.

Prize: \$2,000, Plaque and Certificate.

Funding: Funded by the IEEE Nuclear and Plasma Sciences Society.

Eligibility: Any individual who has made technical contributions to the fields of Nuclear and Plasma Sciences.

Basis for Judging: Selection criteria, in order of importance are:

- Importance of individual technical contributions;
- Importance of technical contributions made by teams led by the candidate;
- Quality and significance of publications and patents;
- Years of technical distinction;
- Leadership and service within the fields of nuclear and plasma sciences and related disciplines.

Presentation: One award presented annually at Nuclear Science Symposium or at an NPSS sponsored meeting chosen by the nominee.

THE NPSS EARLY ACHIEVEMENT AWARD

Description: To recognize outstanding contributions to any of the fields making up Nuclear and Plasma Sciences, within the first ten (10) years of an individual's career.

Prize: \$1,800, Plaque, and Certificate.

Funding: Funded by the IEEE Nuclear and Plasma Sciences Society.

Eligibility: Member of the IEEE NPSS who at the time of nomination is within the first ten (10) years of his or her career within the field of interest of NPSS.

Basis for Judging: Three (3) letters of recommendation, publications and/or reports, patents, etc. which demonstrate outstanding contributions early in the nominee's career.

Presentation: At any major NPSS sponsored conference chosen by the awardee

THE NPSS GRADUATE SCHOLARSHIP AWARD

Description: To recognize contributions to the fields of Nuclear and Plasma Sciences.

Prize: \$500, Certificate, and one – year paid membership in the NPSS.

Funding: Funded by the IEEE Nuclear and Plasma Sciences Society.

Eligibility: Any graduate student in the fields of Nuclear and Plasma Sciences.

Basis for Judging: Evidence of scholarship such as academic record, reports, presentations, publications, research plans, related projects and related work experience, Participation in IEEE activities through presentations, publications, student Chapter involvement, etc., will also be considered.

Presentation: Up to four (4) awards presented annually. Check and certificates sent to nominator to be presented at a special occasion at the winner's institution.

PAUL L. PHELPS AWARD

Description: The Paul L. Phelps award is different, in that its objective is to permit people to attend short courses at IEEE NPSS meetings by giving them travel grants.

Prize: Several travel grants per NPSS conference.

Funding: Funded by the IEEE Nuclear and

Plasma Sciences Society.

Eligibility: Any graduate student in the fields of Nuclear and Plasma Sciences. Also members of the IEEE who are unemployed or have trouble obtaining travel funds. Each grantee must attend a short course.

Basis for Judging: Each conference shall have an appointed chairman to handle Phelps travel grants. The amount of funding per conference is determined by the short course attendance at the previous conference. (Consult the IEEE NPSS Treasurer.) This amount may then be subdivided at the discretion of the appointed chairman to accommodate several recipients. Application for the grant is by a letter to the appointed chairman (or the conference chairman, who will forward it to the proper person) well in advance of the conference date. The letter will convey the need for the grant, as well as biographical and scientific information to demonstrate the scientific capability of the potential grantee.

Presentation: A check will be sent to each grantee, preferably well before the conference, but as soon as possible in the case of late application.

THE IEEE AWARDS PROGRAM

There are an abundance of high – level awards obtainable directly from the IEEE. In general, our society has ignored these awards. To my knowledge, the NPSS has only received ONE such award in its 30 - year history.

Prize: Download the IEEE Award Manual from the web at IEEE AWARDS and be

amazed at what is available! And get to work!

THE IEEE NPSS TECHNICAL COMMITTEE AWARDS:

Description: Most of the Technical Committees under the IEEE NPSS umbrella have their own awards. These awards are in general funded from the committee's conference returns. These awards are tabulated below. Details are obtainable from the IEEE Web page, IEEE.NPSS.

Summary of Committee Awards:

- (1) Computer Applications in Nuclear and Plasma Sciences Award.
- (2) Radiation Effects Award.
- (3) Radiation Instrumentation Early Career Award.
- (4) Radiation Instrumentation Outstanding Achievements Award.
- (5) Fusion Technology Award.
- (6) Particle Accelerator Science and Technology Award (PAST Award).
- (7) Plasma Science and Applications Award.
- (8) Edward J. Hoffman Medical Imaging Scientist Award.
- (9) Young Investigator Medical Imaging Science Award.
- (10) Erwin Marx Award
- (11) Peter Haas Pulsed Power Award.
- (12) Outstanding Pulsed Power Student Award.

Igor Alexeff can be reached at Ferris Hall 315, University of Tennessee, Middle Drive, Knoxville, TN 37996-2100; Phone: +1 865 974-5467; E-mail: alexeff@utk.edu.

The military view

Without war the world would become swamped in materialism.

General Helmuth von Moltke

ARTICLES

Introduction Ronald Schrimpf

As Chairman of the RESG I would like to give the NPSS community an opportunity to learn about one of the most active topics in radiation effects research: Radiation Hardening by Design. RHBD techniques make it possible to improve the radiation tolerance of integrated circuits fabricated in standard commercial processes or, when used in conjunction with process modifications,

to meet the needs of systems that must operate in particularly harsh radiation environments. I have asked Dr. Hugh Barnaby, Arizona State University, to describe recent developments in RHBD. Dr. Barnaby has been attending NSREC since he was a student at Vanderbilt, has served on NSREC conference committees and will be presenting a Short Course session at the 2005 NSREC in Seattle.



Ronald Schrimpf
Chair, Radiation Effects
Steering Group

Will Radiation-Hardening-by-Design (RHBD) Work?

Hugh J. Barnaby

Arizona State University



Hugh J. Barnaby

The continuing shrinkage in the “rad-hard” foundry market is making it more difficult to secure qualified parts that meet the power, performance, and low cost demands of the modern radiation-hardened system. Today’s relatively small market for rad-hard components makes it difficult for the few remaining suppliers of these parts to offer state-of-the-art products (e.g., G4 microprocessors or high speed and density memory) to the manufacturers of satellites and other space systems. This has prompted the designers of these systems to adopt a variety of strategies to ensure the viability of their electronics in the harsh radiation environment of space while simultaneously controlling costs. These strategies range from up-screening commercial parts to the radiation-hardening-by-design (RHBD) approach.

In RHBD, electronic components are manufactured to meet specified radiation performance criteria, but the techniques employed to meet these criteria are implemented either in layout or in the application architecture and not in the fabrication process. RHBD is typically considered distinct from radiation-hardening-by-process (RHBP). Radiation hardening via process modifications is the traditional approach used by rad-hard foundries (although it should be noted that these foundries typically implement both RHBP and RHBD techniques). While RHBP has the advantage of being an extremely reliable means of achieving hardened components, RHBP is susceptible to low volume concerns such as yield, process instability, and high manufacturing costs. These drawbacks, when coupled with the post Cold War contraction of the government electronics market, caused a dramatic industrial exodus from rad-hard manufacturing. The number of rad-hard foundries has gone from more than ten in 1985 to two dedicated foundries today [1].

In order to leverage the economy-of-scale provided by the commercial electronics industry, some rad-hard electronics customers are looking at RHBD as a potentially lower cost solution to persistent radiation threats. The RHBD approach makes sense in today’s evolving electronics marketplace where semicon-

ductor fabrication is becoming more detached from integrated circuit design. IC developers, in companies both large and small, now submit their ASIC designs to external foundries for fabrication. The growth of the field programmable gate array market is another good example of the increasing detachment between design and fabrication. The RHBD methodology fits this new model for IC development, i.e., custom circuits are designed for optimal performance in a targeted radiation environment and fabricated separately in a high volume commercial technology.

However, it is still an open question whether RHBD alone will ultimately work. Ideally, the RHBD approach can produce hardened devices on standard commercial foundry flows, without any modification to the existing process or violation of design and layout rules. However, recent R&D efforts have indicated that the discovery of effective, design rule “clean,” techniques that meet targeted specifications is a more daunting task than originally thought. Many of the conventional RHBD techniques such as re-entrant geometries for total ionizing dose mitigation or dual interlocked storage cells (DICE) for reducing single event upsets are difficult to implement without corresponding electrical performance and area penalties of greater than one generation [2]. Designers for a number of satellite payload manufacturers are now engaged in activities to identify the design practices that will minimize the impact of RHBD on their power, speed, and area targets. Much of this effort relies on detailed understanding of the available commercial technologies and how these technologies respond to a specific set of radiation threats. Designers must often perform detailed modeling and experiments to determine which RHBD technique needs to be implemented to meet mission requirements.

It is generally believed that the greatest radiation-related threats to modern electronic components are single event effects caused by individual energetic particles. Reduced device dimensions and accompanying technological changes have resulted in increased sensitivity to single event strikes. Many of the RHBD

Passing thought

Some days are for living. Others are for getting through.

Malcolm Forbes

techniques available for SEE mitigation rely on redundant architectures, which can have a deleterious effect on performance and area.

Prohibitive performance, power, and area penalties are not the only problems that may impact the ultimate efficacy of RHBD. Indeed, there are other, perhaps larger, unresolved questions including: costs to the end-user, part traceability, and security. With respect to the first question, it is still unknown whether the high costs of commercial parts qualification will be significantly reduced with the RHBD approach. Thus, even though manufacturing expenses may be substantially reduced via RHBD, the need to qualify designs may in the long run erase any cost benefits to the end user. Another benefit of RHBD and the use of rad-hard foundries is their dedication to the rad-hard electronics user. In RHBD, problems associated with the hardness of a particular process or lot may be traced and corrected for the customer. The commercial foundry is unlikely to provide this level of support. Lastly with the rad-hard foundry approach, the lifetime of a classified IC is fairly easy to track, from design, to manufacturing in a cleared facility, and to ultimate insertion into a strategic system. By contrast, the manufacturing cost advantage of RHBD is exactly what makes it a potentially greater security risk, i.e., fabricating the classified IC in a low cost commercial un-cleared foundry.

Today there are several groups actively involved in trying to find answers to these

questions. In 2004, the Defense Advanced Research Projects Agency (DARPA) initiated a program specifically dedicated to determining the workability of RHBD. Participants in the program include the Defense Threat Reduction Agency, the U.S. Air Force, the Boeing Company, ATK Mission Research, and a team of industrial and academic partners. These research efforts may ultimately reveal that the best solution may not be found in selecting one hardening methodology over another but rather in finding the optimal combination of RHBD and process hardening [3] coupled with a firm understanding of the impact of technological advancements on the radiation hardness of a specific system.

- [1] R. Lacoë, D. Mayer, J. Osborn and S. Brown, "New Strategies for Radiation Hard Electronics," 2001 MRQW, December 11, 2001
- [2] R. Lacoë, "CMOS Scaling Design Principles and Hardening-by-Design Methodologies," IEEE NSREC Short Course, 2003.
- [3] N. Nowlin, S. McEndree, D. Butcher, "A Radiation Hardened High-Precision Resolver-to-Digital Converter (RDC)", 2004 IEEE Radiation Effects Data Workshop, July 22 2004, pp 96 – 103.

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Back-lighting

When nighttime electrical lighting was new, it was the poor who burned common candles. When electricity became easily available and practically free, candles at dinner became a sign of luxury.

Kevin Kelly

Chasing rainbows

This is the paradox of measurement: the more objective and precise we get the more nimbly truth manages to keep a certain distance.

Cullen Murphy

Better Ethics Needed to Improve Energy Distribution

Terry Costlow
IEEE-USA, Today's Engineer
Jan. 2005

We can't win

God not only plays dice, but throws them so far they're beyond our reach.

Stephen Hawking

Fortune shines

I'm a great believer in luck - and I find the harder I work the more I have of it.

Stephen Leacock

Not long ago, American energy market leaders viewed deregulation as way to improve profits and trim consumer pricing by managing electricity and natural gas creation and distribution more efficiently. Unfortunately, Enron's accounting shenanigans, rolling blackouts in California, and the 2003 Northeast blackout clouded that view significantly.

Energy leaders recently began making a more concerted effort to make sure that the industry begins living up to the expectations that come with an open market. Experts outlined and discussed the myriad factors involved in this new era of energy distribution at an IEEE-USA-cosponsored seminar, held in October at Notre Dame University on "Ethics and the Changing Energy Markets." All agreed that the stakes are high, since electricity is a basic part of the American infrastructure. "This industry is second only to agriculture in its importance to society," Frank Incropera, Dean of Notre Dame's College of Engineering, told the audience.

Though early attempts to let open markets define the industry bordered on disastrous, many decision makers believe that things can settle down and run smoothly. Eventually, consumers will enjoy the benefits of better pricing, and well-run utilities will realize the rewards associated with efficient management.

"There's nothing about electric power that makes it impervious to regulation by the market, said George Mason University professor Vernon L. Smith, an EE and Nobel Prize-winning economist. "But the market design has to honor the features of the industry, acknowledging engineering and technical constraints."

CONFERENCE FOCUSED ON ELECTRICAL GRID

Many speakers focused on the electrical grid, noting that electric companies can follow the model set by other deregulated energy fields. "Natural gas is the best example of an industry working well after deregulation," said William Hederman, director of the Federal Energy

Regulatory Commission's (FERC) Office of Market Oversight and Investigations.

Hederman, sometimes referred to as the "cop on the beat," said electricity providers have a long way to go before the electric industry can even be considered to be a model for anyone. He noted that that unethical action by Enron and others caused a loss of faith on every side. Investors became reticent, holding down the amount of available capital, while customers and elected officials lost confidence in information provided by utilities and doubted that regulators were protecting the public interest.

FERC responded by improving the response infrastructure and providing more vigilant oversight and rules enforcement, Hederman continued. He said utilities and related companies must operate with more regulation than many other fields, so deregulation is not a precise description of the industry's move to open markets. "It's more restructuring than deregulating," he said.

WHAT WENT WRONG?

Before setting rules for the future, the industry has to understand why problems occurred in the first place. According to Hederman, last year's rolling blackouts and bankruptcies in California won't help create a model for making the link between problems and deregulation. "You can't learn any more about deregulation from looking at California than you can learn about plastic surgery from looking at Michael Jackson," Hederman said.

That's because most analysts contend that California's regulations actually created the problem. Foremost among them was the law that fixed pricing for retail with market pricing for wholesale, which made it difficult to maintain profitability.

"One essential fact is that the problems in California were not created by deregulation, but by strong regulatory rules," said James Sweeney, a Stanford University professor and author of *The California Energy Crisis*.

Experts have analyzed the Enron debacle

heavily, laying bare the interconnection between auditors, Wall Street companies and others. These interconnections prompted people to ignore suspicious activity in order to boost profits. More recently, watchdogs have been given more insight into corporate activities which, in turn, has created an atmosphere that's more conducive to efficient operations. "Markets depend on good faith and ethical actions," Hederman said.

LOOKING AHEAD

Most energy providers accept the idea that regulations will help ensure that energy gets delivered with few problems. Many are working closely with regulators to make sure that regulations don't produce unexpected results, as they did in California and elsewhere.

"Good market rules facilitate competition and limit market power," said Joseph Bowring, manager of the market-monitoring unit at PJM Interconnection, an energy provider headquartered in Valley Forge, Pa.

As on the financial side of the issue, industry watchdogs will pay closer attention to detail and will enforce the rules strictly. The enormous scope of the 2003 Northeast blackout, which affected states from New York to Michigan, affected tens of millions of people. "The 2003 blackout was a turning point," said Michehl Gent, president of the North American Electric Reliability Council (NERC), a Princeton, N.J., group that sets standards and monitors compliance by bulk electrical providers around the country. "We've taken an oath that this will not happen again."

Gent promised that NERC wouldn't hesitate to take definitive action when it discovers problems. In the past, the fraternal feel throughout the industry may have prompted NERC and others to overlook what they knew needed to be done. Those days are now gone. "We're beyond voluntary compliance," he said. "We will measure performance and dis-

close lapses. We have put in sanctions for failure to comply with standards."

NERC worked within the ANSI process to create a readiness audit program that it then integrated with existing compliance programs. The combined audits will be conducted every three years to determine how well utilities are performing. "That was the single most effective thing NERC has ever done," Gent said.

SEPARATE GENERATION AND DELIVERY?

Another suggestion for service improvements is to lessen the market power of large entities by spinning out some of their services. Prof. Smith suggested separating power generation from power delivery. "We have to separate the wires from the energy providers. That principle should be supported at the retail level right down to the plug," he commented.

In New Zealand, this approach led to the emergence of five retail energy companies and common use of controls for turning off water heaters and other products when necessary. Using some equipment at off-peak times should be a key part of energy plans, Smith said. "There should be higher charges for consumers who buy at peak times," he added.

However, several hurdles will have to be overcome before this approach can work. For starters, to turn off equipment to minimize peak usage, companies will have to install technology in homes and offices. The necessary microprocessor-controlled meters are available, but the industry has been slow to adopt them.

"This is an age of sophisticated monitoring and metering, but not in the electric power industry," Smith said. "Local franchise monopolies are not well-motivated to start using technology," partly because the "costs are not trivial."

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A lot of happy fools around

Reason commands us much more than a master. If we disobey a master we are unhappy but if we disobey reason we are fools.

Blaise Pascal

QED

A proof is a proof and when you have a good proof it's because it's proven.

Jean Chrétien

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