

# Nuclear & Plasma Sciences

Number 2 • June 2005

SOCIETY NEWS

## CONFERENCES

### NUCLEAR AND SPACE RADIATION EFFECTS CONFERENCE

Seattle, WA  
July 11-15, 2005

On behalf of the IEEE Nuclear and Plasma Sciences Society Radiation Effects Committee, I invite you to attend the 42nd annual IEEE Nuclear and Space Radiation Effects Conference (NSREC). This year's conference will be held at the Sheraton Hotel and Towers in downtown Seattle, WA, July 11-15, 2005. We will continue the tradition of previous NSRE Conferences by offering an outstanding technical program, a one day Short Course preceding the technical program, a Radiation Effects Data Workshop, and an Industrial Exhibit. Engineers, scientists, managers, and other interested parties from around the world will attend. Some highlights of the Conference are given below; complete details are provided in the booklet. Additional information on the conference is available on the Web at <http://www.nsrec.com>.

The Technical Program Chairman, Mike Xapsos (NASA/GSFC), and his program committee, have



assembled an excellent set of contributed papers that are arranged into ten sessions of oral and poster papers, and a Radiation Effects Data Workshop. The Workshop consists of papers emphasizing radiation effects data on electronic devices and systems and descriptions of new simulation and radiation test facilities. In addition, there are three outstanding invited talks of general interest to both conference attendees and their companions.

Allan Johnston (JPL) has organized this year's Short Course with a theme of "Evolving Issues for the Application of Microelectronics in Space." The Short Course is an excellent learning opportunity to those who are new to the Radiation Effects community and need a quick introduction to the field, as well as those who want to stay abreast of current issues. The Short Course will start with Monday morning sessions devoted to the International Semiconductor Roadmap, and a tutorial on Terrestrial Radiation Effects. Afternoon

*continued on page 3*



**Fred Sexton**  
General Chairman



**Michel Xapsos**  
Technical Program  
Chairman



**Allan Johnston**  
Short Course  
Chairman



**Kay Jobe**  
Local Arrangements  
Chairwoman

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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 July 20, 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 breakthroughs, accomplishments at the big laboratories and similar subjects.

The various Transactions, of course, deal with formal treatment in depth of technical subjects. News articles should have an element of general interest or contribute to a general understanding of technical problems or fields of technical interest or could be assessments of important ongoing technical endeavors.

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

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sessions will focus on Total Dose Effects in Modern Integrated Circuits and Single Event Transients in Linear Integrated Circuits. Attendees can earn Continuing Education Credits at the conclusion of the Short Course.

This year's Industrial Exhibit, organized by Nazik Maloyan (International Rectifier), will permit one-on-one discussions between conference attendees and exhibitors on the latest developments in radiation-hardened and radiation-tolerant electronic devices, radiation analysis and testing services, and radiation test facilities and equipment. On Tuesday evening, attendees and their companions are invited to a reception that showcases the Industrial Exhibit.

Social events have been planned to give Conference attendees and their guests many opportunities to informally discuss radiation effects and to become better acquainted.

Kay Jobe (Boeing Space Systems), this year's Local Arrangements Chairwoman, has put together a memorable social program. The Wednesday evening social is a visit to Tillicum Village on Blake Island, where attendees will sample authentic local cuisine and be entertained by dances and songs recounting the history and tradition of the Native American culture. There will also be time for exploring the island before returning to the conference hotel. We strongly encourage you to register as early as possible for the social events since some of them are limited in the numbers we can accommodate.

Seattle, with its combination of water, hills, and lush greenery set against a backdrop of distant mountains, is one of America's most spectacular urban areas. This easily accessible and pedestrian-friendly city has numerous fine restaurants, interesting museums, and a vigorous arts scene in the downtown area. Unique attractions draw visitors and locals alike, such as the Pike Place Market, featuring the famous "flying fish," the Experience Music Project, a Paul Allen hands-on museum of rock and roll, and the Space Needle, which offers a 360° view of the city and its environs. 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. There are many other attractions that are within easy driving distance.

We are excited about this year's conference and look forward to seeing you in Seattle!

### **SHORT COURSE PROGRAM**

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 on 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.

### **TECHNICAL PROGRAM**

The NSREC technical program will consist of contributed oral and poster papers, three invited papers, and a data workshop. All oral papers will be 12 minutes in length with an additional 3 minutes for questions. The technical sessions and chairpersons are:

- **Space Radiation Environments and Effects**  
- Chair: *Ali Mohammadzadeh, European Space Agency / Netherlands*
- **Terrestrial and Atmospheric Radiation Environments and Effects**  
- Chair: *Clive Dyer, QinetiQ / England*
- **Basic Mechanisms of Radiation Effects**  
- Chair: *Patrick Lenahan, Penn State University*

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## **Without borders**

There is not national science just as there is no national multiplication table; what is national is no longer science

*Anton Chekhov*

---

## **No herbicides either**

Liberty does not consist merely of denouncing Tyranny, any more than horticulture does of deploring and abusing weeds or even pulling them out.

*Arthur Bryant*

## Lest we forget

Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed.

*Dwight D. Eisenhower*

## Too few of the latter, alas

Democracy needs more free speech, for even the speech of foolish people is valuable if it guarantees the right of the wise to talk.

*David Cushman Coyle*

- **Photonics**  
- Chair: Heidi Becker, Jet Propulsion Laboratory
- **Dosimetry and Facilities**  
- Chair: Ewart Blackmore, TRIUMF / Canada
- **Single-Event Effects: Mechanisms and Modeling**  
- Chair: Vivian Zhu, Texas Instruments
- **Single-Event Effects: Devices and Integrated Circuits**  
- Chair: Kevin Warren, Vanderbilt University
- **Hardness Assurance**  
- Chair: James Howard, Jackson & Tull, Chartered Engineers/NASA/GSFC
- **Hardness by Design**  
- Chair: Mark Baze, Boeing
- **Radiation Effects in Devices and Integrated Circuits**  
- Chair: James Felix, Sandia National Laboratories

### INVITED SPEAKERS

Dr. Stephen Malone, Research Professor of Geophysics at the University of Washington and Director of the Pacific Northwest Seismograph Network, will discuss the 2004-2005 eruption of Mount St. Helens and what can be expected next. Astrophysicist Dr. Mario Livio of the Space Telescope Science Institute will present highlights of the Hubble Space Telescope's scientific discoveries. Dr. Larry Dalton, Professor of Chemistry and Electrical Engineering at the University of Washington and Director of the National Science Foundation Science and Technology Center on Materials and Devices for Information Technology Research, will describe performance optimization of organic electro-optic materials for space applications.

### INDUSTRIAL EXHIBIT

Starting Tuesday, July 12, this year's Industrial Exhibit, organized by Nazik Maloyan, International Rectifier, will provide an opportunity for conference attendees to discuss the latest radiation-resistant electronics, radiation analysis and testing equipment and facilities, and hardware and software simulation products and services. An Industrial Exhibits Reception will occur on Tuesday evening.

Exhibitors include:

- 3-D Plus
- Actel

- Aeroflex Colorado Springs
- ATMEL
- ATK Mission Research
- BAE Systems
- Boeing Phantom Works
- Boeing Solid State Electronics Development
- DPA Components International
- Honeywell
- ICS Radiation Technologies
- Idaho Accelerator Center
- International Rectifier
- Interpoint, A Crane Company
- Intersil Corporation
- J.D. Instruments
- J.L. Shepherd & Associates
- Lawrence Berkeley National Lab
- Maxwell Technologies
- Modular Devices
- NASA Goddard Space Flight Center
- NASA Marshall Space Flight Center
- Northrop Grumman Electronics Systems
- Peregrine Semiconductor Corporation
- Prairie View A&M Univ-NASA Center for Applied Radiation Research
- Sandia National Laboratories
- Silvaco
- SVC/WSMR
- Synopsys
- Synplicity
- Texas A&M Cyclotron
- Texas Instruments
- US Semiconductor
- Vanderbilt University
- VPT Inc
- Xilinx, Inc.

### 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 Seattle tour with a visit to the Hiram M. Chittenden Locks, part of the 8-mile 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 visit to the Museum of Glass, an international center for contemporary art with a sustained focus on glass, along with a stop in the quiet waterfront village of Gig Harbor will be offered also.

Please call the Sheraton Seattle Hotel and Tower at 206-621-9000 and ask for the "IEEE NSREC" block of rooms or visit [www.nsrec.com](http://www.nsrec.com) for a link to this reservation block. Reservations must be guaranteed. The

cut-off date for room reservations is June 10, 2005. After that date, room accommodations will be confirmed on a space available basis and the conference room rate is not guaranteed.

#### **ADDITIONAL INFORMATION**

For the latest NSREC information (technical program, conference & social registration forms, hotel and travel information, etc.) please visit our web site at [www.nsrec.com](http://www.nsrec.com).

You may contact the General Chairman, Fred Sexton, Sandia National Laboratories at (505) 844-3927 or E-mail: [sextonfw@sandia.gov](mailto:sextonfw@sandia.gov).

Or you can contact the Publicity Chairwoman, Teresa Farris, Aeroflex, at (719) 594-8035; E-mail: [teresa.farris@aeroflex.com](mailto:teresa.farris@aeroflex.com) who prepared this article.

## **21ST IEEE/NPSS SYMPOSIUM ON FUSION ENGINEERING 2005 (SOFE05)**

**Knoxville, Tennessee, September 26-29, 2005**

**<http://www.ornl.gov/sci/fed/sofe05/>**

**\*\*On-line Registration and Hotel Reservations are Open\*\***

The 21st IEEE/NPSS Symposium on Fusion Engineering (SOFE05) will take place September 26-29, 2005 at the Hilton Hotel in downtown Knoxville, Tennessee. The Symposium is dedicated to the scientific, technological and engineering issues of fusion energy research and presents a mixture of oral presentations and poster sessions allowing for extensive interactions among the participants. The conference is open to the public, and all individuals with an interest in fusion energy are invited to register and attend.

The meeting is being organized by Oak Ridge National Laboratory. The SOFE05 conference General Chair is Nermin Uckan. The Technical Program Chair is David Rasmussen and the chairman of the Local Organizing Committee is Steve Combs. David Swain is the Publications Chair and Gwen Green is the conference coordinator. The organization of the technical program is similar to previous conferences in this series, with plenary sessions in the first part of each morning followed by late morning parallel sessions with oral invited and contributed presentations in selected technical areas. The oral presentations continue in the early afternoon, followed by poster sessions. A special session will include presentations on the expected US scope for ITER (See the article by Phil Heitzenroeder under Technical Committee Reports).

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.

For more information, please visit the SOFE web site at [www.ornl.gov/fed/sofe05](http://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: +1 865 241-8231; E-mail: [uckanna@ornl.gov](mailto:uckanna@ornl.gov).*

*David Rasmussen can be reached at the Oak Ridge National Laboratory, P.O. Box 2008, MS6169, Oak Ridge, TN 37831-6169 USA; Phone: +1 865 574-1158; Fax: +1 865 576-7926; E-mail: [Rasmussenda@ornl.gov](mailto:Rasmussenda@ornl.gov).*

**OOPS!**

Self parking car hits the shops.

BBC News Website



**Nermin Uckan**  
General Chair  
21st SOFE



**David Rasmussen**  
Program Chair  
21st SOFE

# 2005 IEEE NUCLEAR SCIENCE SYMPOSIUM AND MEDICAL IMAGING CONFERENCE (NSS/MIC)

October 23 – 29, 2005

Wyndham El Conquistador, Puerto Rico

<http://www.nss-mic.org/2005/>



**Tom Lewellen**  
General Chair  
NSS-MIC 2005

The 2005 edition of the Nuclear Science Symposium (NSS) and Medical Imaging Conference (MIC) is here again and will be held from October 23 – 29 in Puerto Rico. This is the first time we have held the conference in the Caribbean and the venue is a hotel that exemplifies the local topical nature of the island – the Wyndham El Conquistador. The hotel is situated on top of a bluff on the NE coast of Puerto Rico (about 40 minutes from San Juan). We have the entire conference space reserved and will take full advantage of the venue. For example, the areas around the conference center floors are ideal for informal discussions and exchange of ideas. To facilitate such exchanges (and to allow for easier mixing of conference and family activities), we are arranging the meeting schedule to provide “free” time between 12 noon and 3:30 PM. This “free time” will also be used for a series of lectures on Puerto Rico (history and culture) and small group meetings related to the conference.

The hotel rooms are large and can easily accommodate multiple individuals per room. The many restaurants and snack shops on-site offer a variety of options for dining. For those with special dietary needs, there is a shopping center about a 5-minute drive from the hotel. This will be a different experience than we normally have at a NSS/MIC conference. We are staying at a resort that is outside of major towns and functions as a self-contained unit. We did get a very good room rate for such a high-level property (\$150/night) and have made arrangements with the hotel to provide an option for the hotel transport to meet attendees at the airport (for ~ \$50 round trip). We will remind registrations about this option (one must inform the hotel of the arrival flight information at the time of room registration). There have been some who have raised concerns about the cost of the restaurants on-site. This is a legitimate concern in that these are more expensive than the off-site options atten-

dees have become used to at past meetings. While there are many options, the committee recognizes the limited budgets of many attendees and we will be making efforts to offer some alternatives at the meeting. We can not be more specific, since our ability to offer alternatives is highly dependent on the number of registrations for the meeting. But we will do our best to minimize the impact of a “captive” venue where it is difficult to go off-property for alternative eating establishments.

To meet ever-increasing demand, access to the internet will be expanded with more areas set up for wireless connections – both in and outside of the exhibits area – as well as our more traditional collection of computers. This will also be the first NSS/MIC conference to take full advantage of the computer AV equipment owned by NPSS. All of our computer room systems, the projectors, and the computers connected to the projectors will be from the NPSS pool. The access to a stable, well supported (and virus clean) set of computer and AV hardware for the conference is a major step forward in reducing the worries of the General Chair. The fact is that the person in charge of this equipment (Tony Lavietes) is also my local arrangements chair, so for 2005 the computer and AV issues in regards to the hotel capabilities are also well in-hand.

We do not expect the attendance we have had at Rome or Portland (we do not have the RTSD conference in conjunction with the meeting), but we do have 1119 abstracts as of the deadline, and are expecting over 1000 attendees. We also expect a larger than normal participation at the meeting of families. We are providing a larger companion program and will be working with the hotel to make sure family members are made aware of the many options on-site for activities. The registration pages on the conference web site will have more details, but our companion program chairs will also be available for assistance to attendee families on-site to interface with the hotel options.

## Reductio ad absurdum

*They believe everything they can prove, and they can prove everything they believe.*

*Unnamed novelist quoted in Harper's Magazine*

There will be trainee support available in the form of funds applied toward hotel room and registration fees. Trainees (students and postdoctoral fellows) looking for support will need to have their mentor(s) write a letter to the appropriate technical chair (Richard Lanza for NSS papers, and Simon Cherry for MIC papers) to apply. We are still working on increasing the amount of funds available for such support, so I cannot provide any information at this time on the number of trainees we will be supporting.

One unexpected complication for 2005 was the retirement of Jay Forster who has chaired the Symposium on Nuclear Power Systems that has been part of this meeting for so many years. We were unable to recruit a new chair for SNPS who could work within the constraints of the structure of the NSS/MIC conference, and so I must report that there will not be a SNPS at the 2005 meeting.

The conference closed for abstract submission on May 2 and should open for registration by June 1. We are encouraging attendees to register early to both allow us to look into the aforementioned meal options as well as give us early warning of any problems in the number of hotel rooms we will need. The venue has a large number of rooms available and we do not expect to have any major difficulties. However, after the

experiences in the large number of attendees over the past couple of years, we are also making contingency plans if an overflow hotel is needed. We are expecting to accommodate everyone at the El Conquistador so that all can take full advantage of the relaxed, informal atmosphere, but we will be prepared if the meeting grows beyond our optimistic projections.

We will begin the meeting with NSS short courses on Sunday, October 23. The opening ceremonies will take place on Monday October 24 along with the start of the main NSS program. The commercial exhibits will open on Tuesday, October 25 and close at 8 pm on Thursday, October 27. The MIC short courses will also run on Tuesday. An important event, the exhibitor reception, will be held that Tuesday evening. The MIC will begin with joint NSS/MIC sessions on Wednesday, October 26, and end with the MIC dinner on Saturday evening, October 29. The conference reception will be on Wednesday evening. All in all, a very full week!

For further information visit the NSS-MIC web site at <http://www.nss-mic.org/2005/>

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**Eureka,  
maybe...**

This book deals with an imaginary problem and a real problem. Unfortunately it provides us with an imaginary solution to a real problem.

*Francis  
Fukuyama*



## INTERNATIONAL CONFERENCE ON ACCELERATOR AND LARGE EXPERIMENTAL PHYSICS CONTROL SYSTEMS

**OCTOBER 10 – 14, 2005  
GENEVA, SWITZERLAND**

The operation and control of large physics experiments, for example accelerators, particle detectors, optical and radio telescopes, lasers, nuclear fusion facilities, and gravitational wave detectors, has a scale and complexity that requires a significant investment in computer systems, software and computer-related electronics. The success of this investment is critical to the success of the project as a whole and this meeting addresses the technologies, techniques and choices to be made.

ICALEPCS is a series of biennial confer-

ences that circulate around the globe. Its scope covers all aspects of automation: software, hardware, wireless technologies, internet enhanced operation, closed loop control, engineering, project management, safety, etc.

ICALEPCS 2005, the tenth International Conference on Accelerator and Large Experimental Physics Control Systems, is to be held 10-14 October 2005 in Geneva, Switzerland. It thus falls in the year that UNESCO has declared the "World Year of Physics." This year's conference is organized



**Bertrand Frammery**  
Chair, ICALEPCS 2005



**Jo Lister**  
Co Chair  
ICALEPCS 2005



**Axel Daneels**  
General Organization

jointly by the European Organisation for Nuclear Research (CERN, Geneva, Switzerland), and the “Centre de Recherches en Physique des Plasma” (CRPP) of the “École Polytechnique Fédérale de Lausanne” (EPFL), the Swiss Federal Polytechnical School of Lausanne (Switzerland).

The conference has traditionally attracted controls engineers principally from the particle accelerator community. However, in recent times there has been a growing attendance by people from other research domains, such as fusion and astronomy. It is expected that these communities will have an even larger participation at this conference. ICALEPCS thus offers

a unique opportunity to all those involved in the challenging field of controls for experimental physics worldwide to hear about the latest developments, new projects, the latest technologies being applied, and to discuss problems and solutions with peers from the world’s major laboratories, to identify new issues, and to shape future directions for research.

Full details are available at: <http://icalepcs2005.web.cern.ch/Icalepcs2005/>

*Bertrand Frammery and Jo Lister, Co-Chairmen of ICALEPCS 2005 can be reached at [bertrand.frammery@cern.ch](mailto:bertrand.frammery@cern.ch) and [jo.lister@epfl.ch](mailto:jo.lister@epfl.ch), respectively.*

## NPSS GENERAL BUSINESS

### PRESIDENT’S REPORT



**Bill Moses**  
NPSS President

I’m going to do something different for this Newsletter article. Rather than give an overview of many things that are happening within the higher levels of IEEE, I’m going to focus on a single issue that is important at all levels of IEEE, and that is volunteers. Volunteers are the one thing that IEEE absolutely could not survive without, and so is the one thing that we need the most. To a certain extent, we tend to take them for granted, despite their immense value. Thus, I’d like to talk a little bit more about them and about what “IEEE” is.

When I first joined IEEE, I heard a lot about its size. It is the world’s largest professional association. Over three hundred thousand members. Holds more meetings and publishes more journals than any other professional association. IEEE Spectrum is a very attractive, professional, high-quality magazine. IEEE is the big player in its field — the Microsoft or the General Electric. The amount that I pay for dues is nontrivial. Therefore, my mental picture of “IEEE” was a large, faceless, well-to-do corporation located somewhere far away, presumably in Piscataway, NJ. When I got together with other IEEE members at a conference or a chapter meeting, we often had ideas for how “IEEE” might do things better. We tended to be a little disappointed that “IEEE” didn’t think of these ideas first, but sometimes went as far as passing along the idea to somebody so they could pass it to “IEEE.” The disappointment invariably continued as the crack squad of attractively dressed IEEE operatives never appeared to promptly imple-

ment the idea.

I confess that the previous statement is a bit exaggerated, but it is not too far from the way that I felt when I first began to get involved with IEEE. I recently heard a statistic that showed me just how ridiculous that picture was. There are 300 paid staff in “IEEE”— on average one staff person for every 1000 members! For a Society the size of NPSS (3000 members) that would imply three staff people. Yet NPSS runs eight international conferences, sponsors or co-sponsors four peer-reviewed journals, and has 15 chapters (many in collaboration with other IEEE Societies). This is far, far more than three people could possibly accomplish — how do we do it? You guessed it. Volunteers!

Volunteers provide not only the intellectual vision for what IEEE should be doing, but also the muscle and sweat that actually gets it done. Volunteers really do it all. What I visualized as a shiny, titanic corporate headquarters in Piscataway is really a small group of people that spend most of their effort fighting desperately to keep 39 Societies from going in 39 totally different directions.

By now you might have guessed where I’m going with this. We need you! If you believe that IEEE is doing good things, we need you to volunteer some of your valuable time to make sure that these good things keep happening. We are fortunate in NPSS (and in IEEE) that our volunteers are high quality and that we have enough volunteers to operate very effectively. But we always need fresh blood and your new ideas, and there are always

## De Profundis

Deep down I’m pretty superficial.

Ava Gardner

more things that we would like to do.

I have personally found volunteering in the IEEE to be very rewarding (although I would be awfully foolish to continue volunteering if I didn't). It is a little difficult to explain why, just as it is difficult to justify the pride in earning an advanced degree or to explain the rewards of parenthood to somebody who doesn't have children. A large part of the attraction is the people — the other volunteers. They are intelligent, dedicated, and basically fun to work with. I think that it is possible to rise relatively quickly through the IEEE organization if you have the desire to. Promotion often comes slowly in the universities, corporations, or national laboratories where we work, while "promotion" within the IEEE is often just a matter of saying "I'll do it." I get a lot of satisfaction from "giving back" to the field. I feel that I have personally profited from the ability to present and publish my work through IEEE and have also benefited from access to other people's work through IEEE conferences and publications, and so I would like to make sure that others get this opportunity. Finally, I believe that it has helped me advance in my day job. The organizational and management skills that I have learned by taking on IEEE projects have come in quite handy in my workplace; I have made a tremendous number of very valuable contacts, and being a conference chair or journal editor sure looks good when you are being considered for a raise or promotion.

So how do you go about volunteering? First, realize that you are probably going to start

small — your first task is unlikely to be a conference chair or journal editor. Once you start getting involved, how high you rise is really up to you. Go with your interests and what you are familiar with. If there is a conference that you attend, contact the conference chair and offer your services. There are lots of tasks that need to be done with every conference. They are not always glamorous, but they are all necessary. Once you start working within the conference, you will start seeing things that need doing and start making contacts with other volunteers. Similarly, if you frequently publish in one of the NPSS journals, tell the Editor that you would be interested in reviewing papers. If you are already reviewing papers, mention that you might be interested in becoming an Associate Editor should an opening occur, or would perhaps be willing to put together a special issue. If there is a chapter near where you live, contact the chapter chair and ask what needs doing. Contact information is available on our web site: <http://ewh.ieee.org/soc/nps/>.

In short, "IEEE" is us. It is the volunteers that spend so much of their time to make sure that it runs smoothly. Maybe not perfectly, but we are number one for a reason, and that reason is our outstanding volunteers!

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 AdCom met in Tucson, Arizona on March 12th, following a meeting of the Communications Committee held on the afternoon of March 11th that was attended by a significant number of committee and AdCom members. New members Ilan Ben-Zvi, Chair - Particle Accelerator Science and Technology; Uwe Bratzler, Chair - Transnational Committee; Gerry Cooperstein, Chair - Pulsed Power TC; Chris Deeney, (PSAC); Ron Jaszczak, (NMIS); Dan Jobe, Chair - Plasma Science and Applications; and Jean Pierre Martin, Chair - CANPS were welcomed to the AdCom meeting by President Bill Moses.

Ed Lampo again exhorted conference chairs and treasurers to close their conferences promptly. In general, using IEEE Concentration

Banking helps facilitate this process. Check it out. Several 2003 conferences are close to close out or are in audit. Most 2004 conferences are closing.

Neither TPS nor TNS came close enough to their page budget this year to earn an extra bonus. This has to be corrected especially since income from periodical sales is down significantly. Income from conferences is up just slightly. Overall, NPSS remains in good financial health.

Bill Moses gave the new members of AdCom an overview of IEEE and of NPSS. Much discussion focused on Open Access and how it will affect us. Certainly there must be a mechanism established to support the costs of maintaining and upgrading web sites, web links, indexing, formatting and myriad other

## Pregnant thought

War is to men as maternity is to women.

*Benito Mussolini*



**Albe Dawson  
Larsen**  
IEEE NPSS Secretary

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## I get you

The absence of evidence is not evidence of absence.

*Donald Rumsfeld*

---

## Plus ça change

Powder and artillery are the most efficacious, sure and infallible conciliatory measures we can adopt.

*John Adams*

expensive tasks that are needed to make Open Access possible. There is much work ahead to sort this out and it is likely to be expensive for us. There are many discussions going on in TAB and in IEEE Pubs to figure out what all this will mean. In the interim, IEEE has announced IEEE Enterprise, a scaled-down version of IEL allowing selection of a limited journal package for electronic access and a more flexible package of downloads.

Another IEEE initiative of interest is XELL, a program to make short courses available for sale. The production cost is very high at the moment so we have opted to wait and see how they do. We do offer some outstanding short courses at our conferences so we will keep an eye on XELL's progress and will reassess our interest in involvement after they have some track record.

Conferences are IEEE's second largest source of income. Although NPSS has done very well in terms of growth in conference attendance, that is not true across the Institute. Growth has been flat for a number of years. We continue to think of independent conferences that would benefit from IEEE's umbrella and that would match our subject areas.

Bill announced some realignment of NPSS committee chairs. Peter Winokur has taken the reins of the Fellow Evaluation Committee from Ron Jaszczak, Charles Neumeyer has assumed responsibility for the Distinguished Lecturers program, and we continue to debate our relationship with the Students and Careers committee, the Sensors Council and the IEEE-USA R&D Policy committee. Is there anyone out there interested in the latter? Get in touch with Bill Moses!

Membership matters are under review and Jane Lehr will work on member recruitment and Charles Neumeyer will work on member services. Each will form committees to address these issues. Tony Lavietes has assumed the role of assistant treasurer with primary focus on conference budgets.

At the last TAB meeting our new Student Conference Paper Award was approved. This gives each conference the opportunity to offer two outstanding student paper awards and two honorable mentions. These are funded from individual conference budgets and it is at the discretion of the conference committee and overseeing Technical Committee whether or not to include them. For information on the award procedure, please contact me.

## **TECHNICAL COMMITTEE NEWS:**

All preparations for 2005 conferences are proceeding well. This year the RT2005 conference will be held in Stockholm, Sweden. A record number of abstracts has been received and it is expected that attendance will be good, barring the kinds of international incidents, including the Asian SARS outbreak that limited attendance in 2003.

The Symposium on Fusion Engineering will meet in Knoxville, TN in the fall, with Nermin Uckan as the General Chair and Dave Rasmussen as the program chair. Future SOFE conferences will collocate with ICOPS or the joint ICOPS Pulsed Power Conference. Should the ITER project move forward as hoped, one would expect to see growth in SOFE attendance over the next few years. For an ITER update, see Phil Heitzenroeder's article below.

Plans for both the Medical Imaging Conference and the Nuclear Science Symposium are well in hand. Read Tom Lewellen's article to learn about all the contingency planning. The 2006 meeting will be in San Diego, 2007 in Hawaii and 2008 in Germany. The chairs of the NMIS and RITC are working on their respective Bylaws to bring them into alignment. This will assist in streamlining the organization and management of this highly successful joint conference series. Joel Karp and Paul Kinahan are dealing with the review and editorial issues related to papers submitted for publication to TNS from the MIC.

This is also a year in which the Particle Accelerator Science and Technology Committee together with the APS Division of Particles and Beams hosts the PAC, which will be held in Knoxville, TN and will be over by the time you receive this. See the article under Awards, and look for a report on the conference's successes in the September issue. The new PAST chair, Ilan Ben-Zvi, gave kudos to Bruce Brown for all his work in getting resolutions to many PAC issues including the use of JACoW for posting PAC papers, getting the digitization of PAC proceedings completed, increasing IEEE NPSS involvement in the PAC Organizing committee, working toward getting more senior members and Fellows among the accelerator science and technology members of IEEE, getting visible articles into the Newsletter, and so on. Bruce continues to contribute generously. This year the

Proceedings will be distributed on CD-ROM with paper copies available from IEEE. There will be several special events in honor of the World Year of Physics celebrating the 100th anniversary of Einstein's Theory of General Relativity. PAC07, Stan Schriber, chair, will be held in Albuquerque contiguous to the PPST.

The Plasma Sciences and Applications Technical Committee has revised its Constitution and Bylaws. Look at them in the section on Technical Committee reports. The 2004 conference has closed. The 2005 conference, to be held in Monterey this June 20 to 23, has received ~480 abstracts, somewhat lower than last year. There will be a mini-course on Z-pinches. The 2006 conference will be held in Traverse City, MI with Jess Asmussen as general chair.

The ICOPS will be preceded by both the June AdCom meeting and then the Pulsed Power conference in the same venue, starting on 13 June through 17 June. In 2006 there will be a Megagauss Conference cosponsored by NPSS in Santa Fe, NM. These conferences meet as the Pulsed Power Plasma Science Conference in Albuquerque in 2007.

The next NSREC conference will be held in Seattle in July. See the cover story if you managed to miss it! Conferences are in the planning stage through 2008 and the chairperson for 2009 will be selected in Seattle. The conference is now using IEEE's Manuscript Central to manage papers reviewed for TNS. This year's issue of TNS containing submitted 2004 NSREC papers scheduled for December made it out on time. This is critical for NSREC since the committee uses the journal as part of its review process for selection of the next year's papers.

Craig Woody, chair of the Radiation Instrumentation TC, noted that Homeland Security is a growing field and that there will be a short course on this subject at the NSS in October. This is a new subject to add to the NSS arsenal.

Uwe Bratzler reports that the activities of the Transnational committee include chapter development, supporting non-North American conference locations, encouraging IEEE NPSS awards to non-US citizens, encouraging NPSS membership and dealing with problems of international membership such as clarifying what various institutions are, and recognizing their status appropriately. Communications across many time zones is

nontrivial but must be dealt with to include all regions. The CIP (Conference Information and Promotion Committee) works in parallel with the Transnational committee. It was started to provide support for the Lyon meeting with a group of somewhat younger, enthusiastic people and has grown now to about 50 members worldwide. They have a luncheon at the NSS/MIC conference annually, and they are rather more informal than the Transnational Committee.

#### **OTHER COMMITTEES AND LIAISONS**

The Conference Policy Committee continues to gather and publish on the web, information about upcoming conferences. If you know of a conference that is not listed and should be, contact Ray Larsen to make sure the list is updated (larsen@slac.stanford.edu).

The Awards committee is responsible for awarding the seven Society awards as well as keeping track of the individual TC awards. Very few nominations for 2005 awards have been received as this newsletter goes to press (although the deadline has not yet passed). Read Igor's article below and send in nominations for 2006. It is not too early. We all have deserving colleagues eligible for these Society awards. And we have new awards, just approved by TAB. These are conference Best Student Paper awards. Each conference sponsored by NPSS may include these awards in its budget (at the conference management's discretion). Two awards of \$500 and a certificate each, and two honorable mention certificates are allowed at each conference.

The Membership and Chapters committee reported that U.S. membership in IEEE is down to about 60% while the international membership has climbed to 40%. This is a 6% change for each. Chapters are somewhat strange. They are formed from societies but then come under the aegis of RAB, the regional activities board. Perhaps that is one of the reasons we give them such a low level of support! Does anyone have any thoughts on this?

The Fellows Evaluation Committee report appears below. NPSS has always done a good job in evaluating Fellow candidates, which means that they are honest and realistic in their rankings and the Society is successful. There is a new Fellows category for Applications Engineers and Practitioners to try to encourage more Fellows from industry.

The report of the Nominations committee

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**Is that all there is?**

In every well-governed state wealth is a sacred thing: in democracies it is the only thing.

*Anatole France*

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**Pursuing futility**

The more the universe seems comprehensible, the more it also seems pointless.

*Steven Weinberg*

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## ...in silence

Suffer fools gladly. They may be right.

*Holbrook Jackson*

includes the report on the survey which follows this report. Five AdCom members will be elected in the fall to bring the complement of elected AdCom members back to 16. They will be from Pulsed Power, Radiation Effects, Plasma Science and Applications, Computer Applications in Nuclear and Plasma Sciences and Radiation Instrumentation. If you have ideas for good candidates let either your TC chair or Peter Winokur know.

Paul Dressendorfer announced some Publications Committee changes. For TNS, Joel Karp will take the lead as MIC editor with 5 associates. Zane Bell will be the NSS lead with 16 associates, Jean-Pierre Dufay will be Real Time editor and John Pressler will be lead NSREC editor with two associates. They will start to use MS Central for the 2005 NSREC papers. IEEE is starting to digitize its early journals. TNS started in 1953 and TPS in 1973. Do you have old copies collecting dust somewhere? Why not see if IEEE could use them? They also need the IRE journals for those early years. The TPS special edition "Images in Plasma Sciences" should have a budget included within the Publications budget. TMI, for which we are one of four sponsors, did well in 2004 and came in within the 5% of its page budget so was eligible for a bonus.

See the Communications Committee Report for details about the new brochure and flyers. Remember to request them from Peter Clout (clout@vista-control.com) for your conferences, well in advance of the date needed. The display booth also continues to be available on request.

The liaison to the Social Implications of Technology committee noted that in the 1970s and 1980s we worried about the social values and impacts of technology changes, the development of third world appropriate technologies and so on. The SSIT journal is good and has some compelling articles. The ethics activities of IEEE, despite the strong code of ethics that each member acknowledges at membership renewal each year, is timid and trivial. The independent Online Center for Engineering Ethics in Engineering and Science works hard to provide on-line help to people in need. Most cases involve faculty publishing grad student ideas and work without proper credit, and the problems of line engineers finding unsafe equipment and bringing it to management attention

without resolution by management. Your editor wonders why so many corporations would rather pay big legal fees than pay for safety-motivated design changes.

Standards need updating and reaffirmation. NIM and CAMAC are up for reaffirmation and there should be a new vote soon.

Is anyone out here interested in becoming our liaison to the IEEE-USA R&D Policy Committee? Let Bill Moses know at wwmoses@lbl.gov.

## **UNFINISHED BUSINESS**

Membership issues continue to be studied. It is becoming more and more obvious that each TC has to have a liaison to the membership committee and that they have to begin the management of recruiting at their own conferences. There will be a membership retreat in Piscataway that Jane Lehr will attend. This issue is ongoing.

We have applied to have the Transactions on Nuclear Science included in Index Medicus. If we are rejected, then we will apply again.

## **ADCOM ACTIONS**

- It was moved, seconded and passed that AdCom would pay the extra charges for the TPS special issue, "Images of Plasma Science."
- It was moved, seconded and passed that IEEE NPSS technically cosponsor the 2006 Power Modulator Conference.
- It was moved, seconded and passed that AdCom accept the changes to the PSAC Bylaws. Please see the article on these changes and the new C&B under Technical Committee Reports.
- It was moved that IEEE NPSS cosponsor the Imaging Technologies for Biomedical Sciences 2005. The motion was unanimously opposed.
- It was moved, seconded and passed that the Cyclotron Conference papers be scanned and posted on the JACoW web site. This has been approved by the copyright office and no expenses will be incurred by NPSS.
- It was moved, seconded and passed that the redistribution of AdCom seats in accordance with the recent survey, be accepted. See the following article.

Tony Lavietes has agreed to take on the position of liaison to the Sensors Council. The role of the Students and Careers committee continues to be discussed. Perhaps our focus, through Chas Neumeyer's com-

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## Put down

This book is an opportunity spoiled by opportunism.

*Yves Lavigne*

mittee, should be on GOLD, i.e., Graduates of the Last Decade. This will be assessed.

Jane Lehr will head a committee comprising Gerry Cooperstein, Chris Deeney, Steve Gold, Ron Jaszczak, Alan Johnston, Ed Lampo, Peter Clout, Mike Unterweger and Peter

Winokur to review the IEEE NPSS constitution and bylaws.

The next meeting of the IEEE NPSS AdCom will be held on Sunday, June 12, 2005 at the Portola Plaza Hotel, Monterey, CA before ICOPS and Pulsed Power.

## NPSS SURVEY ALLOCATES ONE ADDITIONAL ELECTED MEMBER TO PULSED POWER S&T

The IEEE Nuclear and Plasma Sciences Society (NPSS) is managed by an Administrative Committee (AdCom) consisting of 16 directly elected members plus certain ex officio members as specified in its Constitution and Bylaws (C&B). The C&B specify that the Transnational Functional Committee (TN) be allocated one directly elected AdCom member. The remaining vacancies are allocated based on the percentage of NPSS AdCom members active in the society's eight Technical Committees. This is accomplished by a periodic survey, typically conducted every five (5) years.

The results of the most recent survey conducted earlier this year are shown in the table below. The three table headings are: Technical Committee (TC), Old Allocation, and New Allocation. NPSS Technical Committees are: Computer Applications in Nuclear and Plasma Sciences (CANPS); Fusion Technology (FT); Nuclear Medical Imaging and Sciences (NMIS); Particle Accelerator Science and Technology (PAST); Plasma Sciences and Applications (PSA); Pulsed Power Science and Technology (PPST); Radiation Effects (RE); and Radiation Instrumentation (RI).

<u>TC</u>	<u>Old</u>	<u>New</u>
CANPS	1	1
FT	1	1
NMIS	2	2
PAST	1	1
PSA	3	3
PPST	1	2
RE	3	3
RI	2	2
TN	1	1
	15*	16

\* During calendar year 2005, the AdCom had only 15 elected members because the Nuclear Instruments and Detectors

Committee (NIDCOM) was changed from a "technical" to a "functional" committee.

The survey maintained the allocation of all technical committee seats except for the Pulsed Power Science and Technology Technical Committee that increased its representation from 1 to 2 elected members. There were nearly 360 ballots cast, which is approximately 20% of NPSS membership. U.S. members accounted for 77.2% of the vote; Region 7 (Canada) for 1.4%; Region 8 (Europe, Middle East, and Africa) for 15.4%; and Region 10 (Asia, Australia) for 6%. No votes were received from Region 9, which is South America. The top 5 voting countries were the U.S., Germany, Japan, the U.K., and France.

In addition to determining representation on AdCom, the survey included a series of questions intended to improve the operation of AdCom and to better understand the interests of NPSS members and opportunities for Society growth.

Not surprisingly, more than half the respondents were involved as NPSS volunteers or indicated a willingness to serve if asked. Clearly, the folks that voted are the members of NPSS most actively involved in our superbly run conferences and prestigious publications. On the other hand, participation in IEEE local section and chapter activities remains low at only 20% of respondents. I believe this is a problem that many technical societies experience and seems to illustrate the dichotomy between IEEE Technical and Regional Activities.

Many of our members belong to other societies. Topping the list is Electron Devices, Computer Society, Microwave Theory and Techniques, Dielectrics and Electrical Insulation, and Engineering in Medicine and Biology. And our members belong to many other non-IEEE societies. Leading the list was the American Physical Society (109), Society for Optical Engineering (23), Society of Nuclear Medicine (22), American Association



**Peter Winokur**  
Chair, Nominations  
Committee

### To hesitate is...

A good plan,  
vigorously  
executed now, is  
better than a  
perfect plan next  
week.

**George S.  
Patton Jr.**

## We wonder too

When you first get to Ottawa, you wonder how you ever got elected. After six months, you wonder how everyone else got elected.

John  
Diefenbaker

for the Advancement of Science (19), American Institute of Aeronautics and Aerospace (16), and American Nuclear Society (15).

NPSS members who responded to the survey visit NPSS and Technical Committee web sites on an occasional basis and support email communications. The NPSS is striving to improve the quality of its web sites thanks to the significant efforts of Dick Kouzes and Peter Clout, who do a great job. I invite you to visit the web site at [www.ieee-npss.org](http://www.ieee-npss.org) for the latest news from AdCom and links to our meetings, conferences, publications, awards, and newsletter. We received many

helpful suggestions to improve the appearance and effectiveness of the NPSS web site, especially to bolster links to our technical committees and their associated conferences and publications.

Congratulations to Bob Tousey of Sunnyvale, CA, whose name was chosen from a drawing of survey respondents. Bob won a Palm Pilot Tungsten E!

*Peter S. Winokur, Chair, NPSS Nominations & Appointments, can be reached at the National Nuclear Security Administration, Washington, DC; Phone: (202) 586-5480; E-mail: [p.winokur@ieec.org](mailto:p.winokur@ieec.org)*

## TECHNICAL COMMITTEES

### FUSION TECHNOLOGY COMMITTEE

**Ed. note:** The following is a report by the Chair of the Fusion Technology Standing Committee to update the community on this preeminent project in the world of magnetic confinement fusion

#### U.S. ITER Project Office Prepares for ITER Involvement; Discussions Continue on ITER Siting



**Philip Heitzenroeder**  
Chair, Fusion  
Technology Technical  
Committee

A U.S. Department of Energy (DOE), Office of Science review of the U.S. Contributions to ITER was held in Oak Ridge from March 22-24. The U.S. contributions are currently “provisional” since the negotiated details need to be finalized after an agreement on ITER siting and other details are concluded. The provisional scope includes 4 of 7 modules of the superconducting central solenoid; the steady-state power supplies; 16% of the diagnostic instrumentation; 44% of the ICRH antennae and all associated transmission lines, rf sources and power supplies; the ECH start-up gyrotrons and all associated transmission lines and power supplies; 10% of the blanket/shield; the Tokamak Exhaust Processing System; the cooling water system required for the divertor and vacuum vessel; and vacuum roughing pumps and standard vacuum components for the guard and service vacuum systems and for the heating systems.

The purpose of the review was to evaluate the project’s readiness for setting the preliminary baseline cost range - so-called “Critical Decision-1,” or “CD-1.” This is one of a series of prerequisites that must be met in order to obtain approval for construction. The review team consisted of experts in the

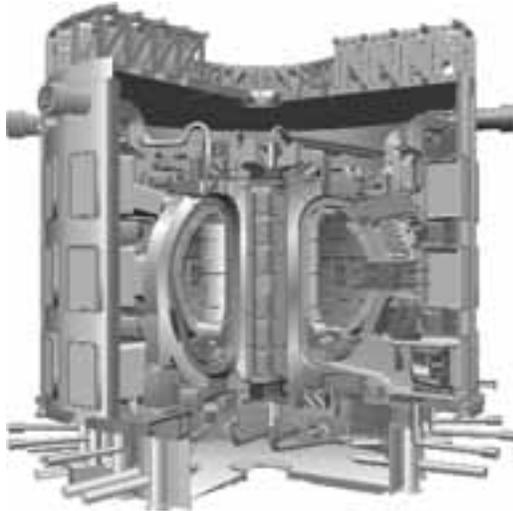
various technology and management areas who evaluated the subsystem scopes of work, costs, schedules, and risk management plans which were presented by members of the U.S. ITER Project Office (USIPO). The USIPO is jointly managed by the Princeton Plasma Physics Laboratory and the Oak Ridge National Laboratory and was established in July 2004 (please refer to the September 2004 IEEE / NPSS Newsletter article “US ITER Project Office Announced” for more details). Also reviewed were a number of documents required for CD-1, including an Acquisition Strategy for procurements, a Preliminary Project Execution Plan, Risk Analysis, Preliminary Cost Range and Schedule, and a Conceptual Design Report which includes an analysis of alternatives. The reviewers made a number of suggestions which are presently being addressed in preparation of formal submittal of these documents for CD-1 approval request in the next month or so. Once CD-1 approval is granted, work can begin on the preliminary design activities whose major goal is to establish a cost baseline.

Japan is proposing a site in Rokkashomura in northern Japan, while France is proposing a

site in Cadarache, southern France. There has been a strong recent increase in the pace of negotiations between Japan and the European Union on the issue of ITER siting after a year of relatively little activity which gives hope that

the impasse may be resolved soon.

*Phil Heitzenroeder can be reached at the Princeton Plasma Physics Laboratory, P.O. Box 451, Princeton, NJ 08543-0451; Phone: +1 609 243 3043; E-mail: pheitzen@pppl.gov.*



*Sectional View of the ITER Tokamak (Courtesy of ITER)*

## Particle Accelerator Science and Technology PAC Electronic Archiving Project

Starting with the U.S. Particle Accelerator Conference in 1995, electronic submission of papers meant that CDs replaced the 2-5 rather thick volumes of books that would arrive several months later. But it was easy to lose the CDs, and the distribution of our collective wisdom was limited to those who attended the conferences. In 1996 Ilan Ben-Zvi proposed a solution to this problem, and his idea has blossomed into the Joint Accelerator Conferences Website at [www.jacow.org](http://www.jacow.org). Housed on two servers in Europe and Asia (the American server was found to be unnecessary due to the copious bandwidth between Europe and America), the contents of these CDs from America, Asia and Europe along with specific conferences such as LINAC, Cyclotrons, DIPAC and ICALEPCS can all be found on this common website. Free access, coupled with a comprehensive search engine, have made this website a premier research tool for accelerator scientists.

Based on seed contributions from PAC2001 and the U.S. Department of Energy, an electronic archiving project aimed

at scanning and electronically posting all past U.S. PAC proceedings was initiated in 2002. Additional financial support was given to the project by PAC2003, IEEE NPSS, and the APS DPB. Remarkably, these electronically archived paper documents are full-text searchable due to the magic of optical character recognition and Adobe software that maps the text onto the scanned image in the form of PDF documents indistinguishable from their later electronically generated sisters. All past U.S. conferences back to the first in 1965 have been scanned and posted on the JACoW website. Electronic archiving of all past European accelerator conferences is underway, with completion expected sometime in the summer of 2005. Other conferences such as LINAC, Cyclotrons, and Applied Superconductivity are also investigating electronic archiving.

*Gerry Jackson has been instrumental in implementing this project. He can be reached at Hbar Technologies LLC, 1275 W Roosevelt Road, Suite 103, West Chicago, IL 60185-4815, Phone: +1 630 231 7077; Fax: +1 630 231 7086; E-mail: g.jackson@hbartech.com.*

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### Cum-savvy

Science is what you know.  
Philosophy is what you don't know.

*Bertrand Russell*

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### Happy as a ...

It is better to be human being dissatisfied than a pig satisfied; better to be a Socrates dissatisfied than a fool satisfied.

*John Stuart Mill*

# PLASMA SCIENCE AND APPLICATIONS TECHNICAL COMMITTEE



**Dan Jobe**  
*Chair, Plasma  
Science and  
Application Technical  
Committee*



**Christine A.  
Coverdale**  
*Chair, Constitution  
and Bylaws Revision  
Committee*

Every 10 years, the Plasma Science and Applications Committee (PSAC) is required to evaluate the effectiveness of its Constitution and Bylaws. The purpose of this evaluation is “to study the rules of governance required by the activities of the Committee at that time, and to consider writing a new Constitution and Bylaws appropriate to the existing and anticipated needs of the Committee.” This evaluation was conducted in 2004 by a 7-member committee consisting of present and past elected members of the PSAC Executive Committee. As a result of the review, a number of changes were proposed to both the Constitution and the Bylaws, and submitted for approval.

The revised Constitution and Bylaws were approved by the PSAC Executive Committee on November 14, 2004, and by the NPSS Administrative Committee on March 12, 2005. They will go into effect unless 20 members of the Plasma Science and Applications Committee object in writing to the NPSS President (Bill Moses, [wwmoses@lbl.gov](mailto:wwmoses@lbl.gov)) within 90 days of the mailing date of this Newsletter. While the entire revised Constitution and Bylaws are printed below, the most significant changes are listed here:

- The PSAC Vice-Chairperson position is now a two-year position (previously it was one year).
- The Vice-Chairperson is the Chairperson-elect. The succession is now two years as Vice-Chairperson, two years as Chairperson, and two years as Most Recent Past

Chairperson. (Previously, the Vice-Chairperson and Chairperson were separately elected and there was no direct succession)

- The Chairperson can designate the Vice-Chairperson or Most Recent Past Chairperson to represent PSAC, and vote, at NPSS AdCom meetings.
- Voting proxies for Executive Committee members have been eliminated.
- The definition of membership in PSAC has been changed to remove the requirement for a subscription to the IEEE Transactions on Plasma Science.
- The process for selection of the PSAC Award recipient has been clarified.
- The responsibilities and authority of the Chairperson of an ICOPS have been clarified, and additional details related to the logistics of ICOPS planning and guidelines have been added.
- The areas of technical interest have been updated.

*This report was prepared by Christine Coverdale who can be reached at Sandia National Laboratories, MS 1159, PO Box 5800, Albuquerque, NM 87185-1159, Phone: +1 505 845 8340; Fax: +1 505 845 7244; E-mail: [cacover@sandia.gov](mailto:cacover@sandia.gov).*

*Daniel Jobe is the Chair of the Particle Accelerator Science and Technology Technical Committee. He can be reached at K-Tech Corp., 1300 Eubank Blvd., SE, Albuquerque, NM 87123-3336; Phone: +1 505 845 7572; Fax: +1 5-5 284 0184; E-mail: [djobe@sandia.gov](mailto:djobe@sandia.gov).*

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## Catch 22

We never arrest anybody who is not guilty. And even if you weren't guilty, we can't release you, because then people would say we are picking up innocent people.

*Soviet police inspector*

# Constitution and Bylaws

## Plasma Science and Technology Technical Committee

### Accepted by AdCom 12 March 2005

#### CONSTITUTION

##### ARTICLE I - NAME AND OBJECT

Section 1. This organization shall be known as the Plasma Science and Applications Committee (PSAC) of the IEEE Nuclear and Plasma Sciences Society (NPSS), referred to hereafter as the Committee. This elective standing technical committee was formed in 1973.

Section 2. The Committee shall strive for the advancement of the theory and applications of plasma science and of its allied arts and sciences and the maintenance of high scientific and technical standards among its members.

Section 3. The Committee shall aid in promoting close cooperation and exchange of technical information among its members, and to this end shall hold meetings for the presentation and discussion of original contributions, shall assist in the publication of the Transactions on Plasma Science, and shall otherwise provide for the needs of its members.

Section 4. The Committee shall attempt to provide information on plasma science to those who request it.

##### ARTICLE II - FIELD OF INTEREST

Section 1. The field of interest of the Committee is the plasma sciences and their related technologies and applications. The Committee shall foster publication or other dissemination of original contributions to the theory, experiments, educational methods, and applications of plasma science, and to the development of standards. Areas of technical activity will include, but not be limited to the following:

Section 2.

1. Magnetohydrodynamics
2. Thermionics and plasma diodes
3. Basic plasma phenomena
4. Gaseous electronics
5. Microwave-plasma interaction
6. Electron, ion, and plasma sources
7. Space plasmas
8. Intense electron and ion beams
9. Laser-plasma interactions
10. Plasma diagnostics
11. Plasma chemistry and processing
12. Solid-state plasmas
13. Plasma heating
14. Plasmas for controlled fusion research
15. High energy density plasmas
16. Industrial, commercial, and medical applications of plas-

ma science

17. Plasma waves and instabilities

18. High-power microwave and submillimeter wave generation

19. Pulsed power applications of plasmas

##### ARTICLE III - MEMBERSHIP

Section 1. Members of the Committee are members or affiliates of the NPSS who have a professional interest in plasma science and applications. Only members of the Committee are entitled to vote on Committee matters.

##### ARTICLE IV - ADMINISTRATION

Section 1. The Committee shall be managed by an Executive Committee (ExCom) consisting of elected members-at-large, plus certain other members as specified herein and in the Bylaws. The number of elected members-at-large shall be 18 members.

Section 2. The terms of office of the elected members-at-large shall be three years. Members-at-large elected to three-year terms may not succeed themselves; however, such members-at-large may be candidates in the election held immediately after their term of service, for the term beginning a year after the expiration of their previous term. Election of members-at-large shall be held annually to fill vacancies for the coming year. The terms of office of the other members shall be specified in the Bylaws.

Section 3.

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

(b) The Chairperson shall appoint a Secretary for the Committee. The Secretary need not be chosen from among the elected members-at-large, but should be a member of the Committee.

Section 4.

(a) The position of Chairperson shall be filled by succession of the Vice-Chairperson, subject to the approval of ExCom. In even numbered years, beginning in 2006, a Vice-Chairperson shall be elected by the voting members of the ExCom from among the eligible members-at-large of the ExCom to serve for two years. Following this two-year

term, he or she will be the sole candidate in an election for Chairperson, as specified in the Bylaws. If he or she is not approved, the procedure specified in the Bylaws will be used to select the next Chairperson. The Most Recent Past Chairperson shall serve for two years in a non-voting, advisory capacity.

(b) All directly elected members of ExCom are eligible for election as Vice-Chairperson or Chairperson. The term on the ExCom of the Vice-Chairperson and of the Chairperson shall automatically extend until they vacate their offices. During this period the Vice-Chairperson and the Chairperson shall be considered full members with vote. No individual may be elected as Vice-Chairperson immediately after a term as Chairperson.

(c) In the event that neither the Chairperson nor the Vice-Chairperson is able to take office as prescribed in the Bylaws or if both are incapacitated or if both offices become vacant, the ExCom shall promptly elect an Acting Chairperson from among the members-at-large to assume the duties of Chairperson until either the Chairperson or Vice-Chairperson takes office or resumes his or her duties.

(d) If the Vice-Chairperson is unable to become Chairperson at the end of the two-year term, both the Vice-Chairperson and Chairperson positions will be considered vacant. A new Chairperson and a new Vice-Chairperson shall be elected by the voting members of the ExCom from among the eligible members-at-large of the ExCom. In this case, the Chairperson would serve two years and then become the Most Recent Past Chairperson, and the Vice-Chairperson would succeed to Chairperson as prescribed above.

(e) If the position of Vice-Chairperson is vacated at any other time during the two-year term, a replacement Vice-Chairperson will be elected by the voting members of the ExCom from among the eligible members-at-large to complete the remainder of the term. This may also occur at the conclusion of the one-year term of a Vice-Chairperson elected under the Constitution as it existed prior to 2005. Upon completion of the Vice-Chairperson term, this Vice-Chairperson would then succeed to Chairperson as prescribed above.

(f) In the event of the Chairperson's absence or incapacity, the Vice-Chairperson shall perform the duties of the Chairperson.

Section 5. The Chairperson shall be an ex-officio member of all subcommittees of the Committee.

Section 6. The Chairperson, as soon as expedient after election, shall appoint the chairpersons of the subcommittees provided for in the Bylaws. All appointees serve at the pleasure of the Chairperson.

## **ARTICLE V - NOMINATION AND ELECTION OF EXECUTIVE COMMITTEE MEMBERS-AT-LARGE**

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

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

Section 3. If a member of the ExCom does not complete a term, the vacancy shall be filled at the next regular election for the unexpired portion of the term.

## **ARTICLE VI - MEETINGS**

Section 1. The Committee may hold meetings, conferences, symposia or conventions either alone or in cooperation with other organizations, subject to applicable IEEE and NPSS rules and regulations. The primary conference to be held by the Committee shall be the IEEE International Conference on Plasma Science (ICOPS).

Section 2. Meetings, conferences, or conventions sponsored by the Committee shall be open to all members or affiliates of the NPSS. The Committee may not sponsor or cosponsor a meeting which is in any way subject to security clearance.

Section 3. Eight voting members of the Executive Committee shall constitute a quorum. No member shall have more than one vote for any reason. A member-at-large may appoint a proxy to represent him or her at an Executive Committee meeting. However, such a proxy may not cast a vote.

Section 4. A majority of the legal votes cast by those members of the Executive Committee attending a meeting shall be necessary for the conduct of its business except as otherwise provided in this Constitution.

Section 5. The business of the Executive Committee may be handled by correspondence, telephone, or electronic communications (fax, email, etc.) where, in the opinion of the Chairperson, matters requiring prompt action can be adequately handled in that manner. A majority vote of the full ExCom is required to take action in such cases. Telephone actions are to be promptly confirmed in writing by the Chairperson.

Section 6. The Executive Committee shall meet as required to conduct business and in accordance with the Bylaws.

Section 7. If the PSAC Chairperson is unable to represent the Committee at meetings of the NPSS Administrative Committee (AdCom), the Chairperson may designate the Vice-Chairperson or the Most Recent Past Chairperson as his or her alternate. This alternate shall have the privilege of the floor and may vote on all matters coming before AdCom.

## **ARTICLE VII - AMENDMENTS**

Section 1. Amendments to this Constitution may be initiated by petition submitted by a two-thirds vote of the ExCom, such petition being submitted to the Ad Com of the NPSS for approval. After such approval, the proposed amendment shall be published in the NPSS News, with notice that it goes into effect unless 20 members of the Plasma Science and Applications Committee object in writing to the President of the NPSS within 90 days of the date of mailing of the notice.

If such objections are received, a copy of the proposed amendment shall be mailed with a ballot to all members of the Committee at least 30 days before the date set for the return of the ballots; the ballots shall carry a statement of the deadline for their return to IEEE Headquarters. When a mail vote of the entire Committee membership is made necessary, approval of the amendment by at least two-thirds of the ballots returned shall be necessary for its enactment.

Section 2. As an alternative to the procedure outlined in Section 1 above, ten members of the Committee may submit a petition to the AdCom of the NPSS. If approved by the NPSS AdCom and after notification of the ExCom, the proposed amendment shall be submitted to the membership of

## **BYLAWS**

1. Executive Committee: Article IV, Section 1 of the Constitution provides that the ExCom shall consist of a number of elected members-at-large plus certain other members. These other members of the ExCom shall be, unless they are already elected members-at-large, the Chairperson of the Committee, the Vice-Chairperson of the Committee, and the Editor of the Transactions on Plasma Science. Certain other individuals who are carrying out specific functions or activities are also expected to attend the ExCom meetings, even if they are not voting members of the ExCom. These include the Secretary, the elected AdCom members representing the interests of PSAC, the Most Recent Past Chairperson of the Committee, the chairpersons of the Functional Subcommittees, and the chairpersons of the ICOPS to be held the following two years. In addition, chairpersons of ICOPS to be held more than two years in the future are expected to attend at least one ExCom meeting per year, in order to present a progress report on the preparations for their conferences.

1.1 The voting members of the ExCom shall be the elected members-at-large, the Chairperson and the Vice-Chairperson of the Committee, and the Editor of the Transactions on Plasma Science.

1.2 The ExCom shall meet at least two times per year, upon dates determined by the Chairperson at least three weeks in advance of the meeting. One of these two meetings shall be held in conjunction with the IEEE International Conference on Plasma Science (ICOPS). Additional meetings may be called at the discretion of the Chairperson or upon request of at least nine voting members of the ExCom with at least three weeks notice.

the entire Plasma Science and Applications Committee for ratification by mail ballot as described in Section 1.

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

## **ARTICLE VIII - REVISION**

Section 1. The Chairperson of the Committee shall appoint a seven-person subcommittee every tenth year, starting with January 1, 1984, to evaluate the effectiveness of this Constitution and Bylaws, to study the rules of governance required by the activities of the Committee at that time, and to consider writing a new Constitution and Bylaws appropriate to the existing and anticipated needs of the Committee.

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

1.4 In the absence of extenuating circumstances as approved by the ExCom, an elected member-at-large who misses three successive meetings shall automatically be dropped from the ExCom.

2. Nomination and Election of Executive Committee Members-at-Large: As specified in Article IV, the ExCom shall include 18 members-at-large, each serving a three-year term. Six posts, plus any vacancies occurring in the previous year, are to be filled each year by election of the general membership of the Committee.

2.1 At least one nomination for each vacant post as a member-at-large shall be made. Nominations may be made by any member of the ExCom or any member of the Committee, up until a date fixed each year by the Chairperson of the Committee. That date shall be no later than July 1, but may be extended if required. Self nominations are permitted. The Chairperson of the Committee is responsible for ensuring that at least one nomination is obtained for each position to be filled.

2.2 The individual making a nomination must determine in advance that the nominee is willing to serve if elected. A nomination is only valid if it is submitted in writing to the Chairperson or the Secretary of the Committee. The name, address, e-mail address, and phone number of the nominee must be included, as well as a short biographical statement. In addition, the nomination must provide either the IEEE membership number of the nominee, or a statement that an application for

membership in the IEEE and PSAC has been submitted.

2.3 If there are more nominations than posts to be filled, those nominees receiving the highest number of votes will be elected. Any vacancy on the ExCom resulting from an uncompleted three-year term shall remain unfilled until the next regularly scheduled election. At that time, the remainder of the uncompleted term shall be filled by the nominee receiving the next highest vote total after determination of the six regular three-year terms. In the event of a tie vote by the general membership of PSAC, the individual selected will be determined by a majority vote of the voting members of the ExCom. The tie-breaking vote of the ExCom members shall be conducted by fax or electronic mail by the Secretary of the Committee. The Secretary shall endeavor to obtain the results as far as possible in advance of the Annual Meeting of the ExCom.

2.4 The Chairperson of the Committee shall arrange, before April 1, that a call for nominations is conveyed to the whole membership through the NPSS News.

2.5 Current members-at-large of the ExCom who are serving full terms are ineligible for nomination.

2.6 All nominees must be either members in any grade of IEEE and NPSS or must have submitted an application for membership in IEEE and NPSS at the time the nomination is forwarded to IEEE Headquarters. An affiliate member of NPSS is not eligible to be a nominee for member-at-large.

2.7 The Secretary shall annually arrange for the distribution to the members of the Committee, on or about July 31, of a ballot to elect the candidates to fill member-at-large vacancies on the ExCom. The ballot shall be accompanied by a short biographical statement from each nominee.

2.8 Sixty days after distribution of the ballots, the IEEE Headquarters shall count and tabulate the votes received and report the results to the Secretary of PSAC, who, in turn, shall notify the Chairperson.

2.9 The Chairperson of the ExCom shall submit to the Secretary of the NPSS AdCom the names of the candidates elected to fill the designated vacancies.

2.10 A member-at-large who is elected to fill an uncompleted term is eligible for renomination to ExCom for a term beginning at the expiration of the partial term.

3. Each of the Functional Subcommittees shall submit a written report of its activities to the ExCom prior to or at the Annual Meeting.

4. Functional Subcommittees: The Chairperson of the Committee shall appoint the chairpersons and members of the following Functional Subcommittees:

(a) Membership Subcommittee: To recommend to ExCom and to implement approved actions to increase PSAC membership.

(b) Site Selection Subcommittee: To identify, encourage, and solicit potential ICOP sites and conference chairpersons.

(c) Human Rights Subcommittee: To recommend to ExCom and to implement approved actions to foster human rights.

(d) Minicourse Subcommittee: To identify, encourage, and solicit potential ICOPS minicourses.

(e) Awards Subcommittee: To identify, encourage, and solicit PSAC member candidates for various IEEE awards, including the Plasma Science and Applications Award (see Bylaw 14).

The Chairperson may authorize additional Functional Subcommittees if deemed necessary for the efficient functioning of the ExCom.

4.1 The terms of office of chairpersons of Functional Subcommittees shall be one year.

4.2 The chairpersons of Functional Subcommittees must be members of the Committee.

5. Ballots: Ballots intended for all members of the Committee shall be prepared by the Secretary at the direction of the Chairperson. No ballot shall be counted unless it is unambiguously marked by a qualified Committee member to indicate his or her choice and sent in a sealed envelope bearing the voter's name on or before the specified deadline date or is transmitted by other secure voting means as IEEE may in the future provide. This specified deadline date shall be at least thirty days subsequent to the date of the mailing of the ballots. The distribution and counting of ballots issued to all members of the Committee shall be entrusted to IEEE Headquarters. The Secretary of the Committee shall report the results to the ExCom at the Annual Meeting.

6. Beginning of Terms of Office: All terms of office of elected members-at-large of the Executive Committee shall begin January 1 of the year immediately following their election.

7. The Chairperson of the Committee shall actively encourage the broadest possible representation from throughout the plasma science community on the ExCom and in its activities.

8. Any member of the Committee may present a contributed paper at meetings sponsored by the Committee, provided that the subject matter of the paper is, in the judgment of the Program Committee for the meeting, germane to Plasma Science.

9. The Editor of the Transactions on Plasma Science and the

Editorial Board shall strive to assure that publication of papers in the Transactions depends only upon the technical merit of the paper, and not upon the financial condition of the author.

10. Election of Chairperson of PSAC: The Chairperson of PSAC is elected by written ballot in even-numbered years. The ballot will indicate two choices: 1) the current Vice-Chairperson and 2) an indication that an open election is desirable. The Secretary of the Committee shall send written ballots to all voting ExCom members at least three weeks prior to the Annual Meeting. The marked ballots may be sent or delivered in person to the Secretary prior to the beginning of the Annual Meeting. The Chairperson shall designate tellers to verify and count the ballots during the Annual Meeting. Should the Vice-Chairperson fail to receive a majority of the ballots cast, then ExCom will itself determine a slate of candidates for Chairperson and vote at the Annual Meeting. The term of office of Chairperson shall begin January 1 of the year immediately following the election.

11. Election of Vice-Chairperson of PSAC: The Vice-Chairperson of the ExCom shall be nominated and elected from among the eligible elected members-at-large of the ExCom. Nominations and seconds shall be solicited by the Chairperson prior to the Annual Meeting in even-numbered years. The Chairperson will accept nominations and seconds up to one month prior to the Annual Meeting. The slate of candidates for Vice-Chairperson will appear on the same ballot as the election for Chairperson, and the same tabulation process shall be followed. After the election of the Chairperson at the Annual Meeting, the vote for Vice-Chairperson shall be announced and the nominee receiving a majority of votes cast shall be declared elected. In the event that no candidate receives a majority of votes cast, runoff elections shall be conducted by secret ballot at the Annual Meeting between the candidates receiving the two highest numbers of votes until one candidate receives a majority of the votes cast. The term of office of Vice-Chairperson shall begin January 1 of the year immediately following the election.

12. The IEEE International Conference on Plasma Science: The chairperson of an ICOPS must be a member of the Plasma Science and Applications Committee. The ICOPS Chairperson and the ICOPS site are selected by the ExCom from proposals brought forward by the Site Selection Subcommittee. The ICOPS Chairperson is expected to follow the guidelines established by ExCom and in the Manual for the Policy and Procedure for IEEE/NPSS Conferences. The Conference Chairperson is responsible for the budget of the conference and determines the registration fees to be charged, subject to approval by the ExCom and the NPSS. He or she shall appoint the members of the Organizing Committee and the Program Committee. At least one former chairperson of an ICOPS shall be included on the Program Committee. The ICOPS Chairperson shall also present a list of Technical Area Coordinators (TACs) to the ExCom for approval at the Annual Meeting 18 months prior to the con-

ference and a list of Session Organizers (SOs) to the ExCom for approval at the ExCom meeting 12 months prior to the conference. These two lists shall not include individuals who have served consecutively in the same capacity for the 3 prior ICOPS. Any minicourse offered must be submitted for approval to the ExCom and should follow the ICOPS Minicourse Guidelines. The ICOPS Chairperson shall have full authority over the management and technical content of the conference, subject to the oversight of ExCom.

13. Open Business Meeting of the Committee: An annual open Business Meeting of the Committee shall be held in conjunction with ICOPS.

14. The Plasma Science and Applications Award: To recognize outstanding individual contributions to the field of Plasma Science, the Committee presents a Plasma Science and Applications Award at the ICOPS. The Award consists of a monetary award and a plaque, with the award money included in the ICOPS budget. Changes in the Award amount must be approved by AdCom and the appropriate IEEE committee. The recipient shall be invited to deliver an address at the ICOPS in the year of the Award and to submit the text of the talk for an invited paper in the Transactions on Plasma Science. Publicity announcing the recipient shall appear in appropriate NPSS publications and in other professional publications.

Nomination forms for the following year's award are to be distributed at the ICOPS. A nomination must be endorsed by three current IEEE members. Any person except a current voting member of the ExCom or a previous PSAC Award recipient is eligible for the Award. Nominations are submitted to the chairperson of the Awards Subcommittee, who shall mail nomination materials to the voting members of the ExCom at least one month prior to the Annual Meeting. Selection of the recipient is performed by the PSAC Special Awards Subcommittee, which is comprised of the Chairperson and the Vice-Chairperson of the Committee, the elected members-at-large of the ExCom, and the Editor of the Transactions on Plasma Science. The selection is based upon scientific accomplishments in the field of plasma science, professional service to PSAC and the plasma science community, and any other information the Special Award Subcommittee wishes to consider. No more than four votes of the Special Award Subcommittee by secret ballot shall be taken at a separate Subcommittee Meeting following the Annual Meeting. The vote of at least 3/4 of the Subcommittee present, but no fewer than six votes, is required to select a recipient. If no agreement of the Subcommittee can be reached or if no candidates are nominated, the Award will be skipped for that year.

15. The Secretary shall maintain a permanent record of the minutes of past meetings and shall forward these records to the successor at the conclusion of the term as Secretary. The Secretary shall also provide a copy of the PSAC Constitution and Bylaws to each newly elected member-at-large.

November 3, 2004.

## RADIATION INSTRUMENTATION TECHNICAL COMMITTEE



**Craig Woody**  
Chair, Radiation  
Instrumentation  
Technical Committee

This will be just a short update on the activities of the RISC since the last Newsletter. The main activity has been with the Site Selection Committee which has been looking into possible sites for the 2008 NSS/MIC meeting. The leading location is Germany, with three possible sites there being Berlin, Dresden and Hamburg. The site selection process in Germany is being coordinated by a local Site Selection Team which includes Uwe Bratzler, Patrick LeDû, Erik Heijne, Ralph Engles, Klaus Mueller and Maxim Titov.

Several members of the Site Selection Committee (Ron Keyser, Craig Woody and Roger Gearhart) will visit all three sites in late May to get a first hand look at the facilities at each location, and will report back to the Site Selection Committee on their findings. It is hoped that it will be possible to make a decision on the final site by midsummer, along with naming a General Chair for the meeting. Also, since the last Newsletter, Dr. Benjamin Tsui from Johns Hopkins University has been named the General Chair for the 2007 meeting. Ben was MIC Chair in 2001, and we welcome his experience and willingness to chair the 2007 meeting in Hawaii.

Plans for the 2005 NSS/MIC, to be held in San Juan, Puerto Rico from October 22-29, are progressing well. Tom Lewellen and several people from the Organizing Committee had a meeting at the hotel in October, and the full Committee met there on March 7-8th. A request for funds to support students has been submitted to the NIH, and the Committee is exploring possibilities for obtaining additional support for students from the DOE and DHS, as well as from local agencies in Puerto Rico. Planning for the industrial exhibit is going well with the new exhibits contractor (APS), and there are already several major companies signed up. There is a concern whether the room block at the hotel is large enough, especially given the very large turnout at the 2004 meeting in Rome. Negotiations are currently under way to have a more flexible room block that could accommodate a potentially larger number of attendees. A full list of Short Courses will soon be available. The call for papers went out in early March with an abstract deadline of May 2, 2005, and registration is expected to be open shortly.

Planning for the 2006 NSS/MIC/RTSD, to be held Oct 28 – Nov 4 at the Town and Country Resort and Convention Center in San Diego, is also progressing well. Representatives for all major roles on the Conference Committee have been named. A poster advertising IEEE2006 was made available at the Rome meeting, and the 2006 Conference Committee members who were in Rome met to begin the planning process. Some Conference Committee members will visit the Town & Country later this summer, with more comprehensive meetings to be held during 2006. Other items being worked on are the Call for Papers and the Industrial Exhibitors brochure. Confirmation has been received from the Room Temperature Semiconductor Workshop community that the RTSD conference will be held in conjunction with the 2006 NSS/MIC, and one accompanying Workshop has been confirmed.

The RITC Outstanding Achievement Award will also be given 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 a 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](mailto: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.

Finally, 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](mailto:woody@bnl.gov) or give me a call at 631-344-2752.

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

### Perigee

Close only  
counts in horse-  
shoes and hand  
grenades.

George C.  
Wallace

### AWARDS COMMITTEE

#### Call for Award Nominations for 2006

The time is PAST for nominating your well – deserving colleagues for the 2005 IEEE Nuclear and Plasma Sciences Society and Committee awards. If you have any questions, e-mail or call me. The deadline for receipt of applications for the next round of NPSS Awards is May 15, 2006.

The NPSS Awards comprise the following.

#### 1. 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.

**Award:** \$ 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.)

#### 2. The NPSS Merit Award.

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

**Award:** \$ 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;

c. Quality and significance of publications and patents;

d. Years of technical distinction;

e. 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.

#### 3. 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.

**Award:** \$ 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 fields 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.

#### 4. The NPSS Graduate Scholarship Award

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

**Award:** \$ 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 pre-



**Igor Alexeff**  
Chair, Awards  
Committee

#### The long and short of it

Tom Levitt's twenty-twenty vision into marketing myopia was farsighted.

Michael Schrage

## Do unto others...

There are many who have grave scruples about deceiving others but think it nothing to deceive themselves.

*Eric Hoffer*

sented annually. Check and certificate sent to nominator to be presented at a special occasion at the winner's institution.

### 5. Paul L. Phelps Travel Grants

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

**Award:** Several travel grants per NPSS conference hosting short courses.

**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.

### 6. 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 TWO such awards 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!

### 7. 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, <http://ehw.ieee.org/soc/nps/>

#### 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.
- (13) Conference Outstanding Student Paper Awards – check to see if your conference offers them.

*Igor Alexeff, the Awards Chairman can be reached at the University of Tennessee, Ferris Hall 315, Middle Drive, Knoxville, TN 37996-2100 alexeff@utk.edu 865-974-5467*

## COMMUNICATIONS COMMITTEE

With the New Year we have been preparing the new brochure and leaflets for use in membership communication and promotion for the coming two years. These will be seen at the upcoming meetings that we sponsor. This year we have produced a new leaflet highlighting the involvement of the NPSS community in differ-

ent areas of science and engineering. As before, we will be having the membership booth at most of these meetings and luckily for us, Vern Price has agreed to spend another year looking after the booth at several of these meetings. At other meetings, we will be relying on volunteers attending the meeting to give up some of their time there to answer questions on the



**Peter Clout**  
Chair,  
Communications  
Committee

IEEE and NPSS and otherwise promote membership and other broader involvement.

Prior to the recent AdCom meeting, the Communications Committee held an open meeting with the primary focus of ensuring the maintenance and expansion of the web site. This work is not a small task and luckily we have the invaluable help of Dick Kouzes for the maintenance of the mechanics of the web site so that other volunteers only have to worry about the content and links.

As ever, I welcome comments and suggestions as to how we can do better. Material is available from me, and my company looks after

the storage and shipping of NPSS literature and the booth to the meetings. We are always looking for volunteers to help and even if you can not spend time at the booth, please suggest to colleagues that they consider joining IEEE and NPSS if they are not already members. Need background information and points of discussion? Take a look at the brochure and chat to Vern Price and others.

*Peter Clout, chair of the Communications Committee, can be reached at Vista Control Systems Inc., 176 Central Park Sq., Los Alamos, NM 87544-4031, Phone: +1 505 662 2484; Fax: +1 505 662 3956; E-mail: clout@vista-control.com.*

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**Are you lonely tonight?**

**To be right too soon can be a terrible and lonely fate.**

**John Fraser**

## IEEE FELLOW CANDIDATE EVALUATION COMMITTEE NEW CATEGORY FOR MEMBERS OF INDUSTRY

The IEEE Board of Directors recently approved changes to the process for nominating and electing IEEE members to Fellow Grade. The goal of these changes is to increase the number of nominations received for members from industry and to make the process more receptive to nominations received for application engineers or engineering practitioners who have made contributions of unusual distinction to the profession. Specifically the changes established a new nomination category for individual contributions, "Application Engineer/Practitioner." This category recognizes significant contributions in "product development, advancement in system, application or operation, project management or construction activity, process development, manufacturing innovation, codes or standards development, or other application of technology."

Also, the existing designation, "Engineer/Scientist" was changed to, "Research Engineer/scientist." The other existing categories, "Educator" and "Technical Leader" remain the same. So, the IEEE now recognizes contributions in four distinct categories.

The deadline for receipt of the Fellow Nomination Forms and Reference letters is the 1st of March this year, which is earlier than in previous years due to the growing volume of nominations. Nominating forms, detailed instructions, and frequently asked questions can be found at the IEEE Fellow Program Web Site at [www.ieee.org/fellows](http://www.ieee.org/fellows).

This is the second year for the IEEE Electronic Fellow Nomination Process. Last year, half of the Fellow nominations were submitted electronically. Most people found the process very easy to use but, as expected, the process needs to be fine tuned. This year's enhancements include the following: operate with Macintosh computers, automatically forwards a copy of the completed nomination form to references, and prints the forms in a friendly version. These changes will no doubt make it even easier for you to complete an electronic nomination form.

Have you ever wondered how an IEEE member becomes an IEEE Fellow? The following description of the process can be found on the IEEE Fellow Program Web Site: "The grade of IEEE Fellow recognizes unusual distinction in the profession and shall be conferred only by invitation of the Board of Directors upon a person of outstanding and extraordinary qualifications and experience in IEEE-designated fields, and who has made important individual contributions to one or more of these fields. The year of election to the grade of Fellow is the year following affirmative action by the Board of Directors in conferring the grade of Fellow. A brief citation is issued to new Fellows describing their accomplishments and the total number selected in any one year does not exceed one-tenth percent of the total voting Institute membership." But, at its core, an IEEE Fellow has been judged to have made extraordinary contributions in any of the IEEE



**Peter Winokur**  
Chair, Nominations  
Committee

## Your choice

Man must choose whether to be rich in things or in the freedom to use them.

*Ivan Illich*

fields of interest that are of significant value to the profession and society.

Who is eligible to be nominated? The following requirements are from the IEEE Fellow Program Web Site: "To be nominated, the candidate must meet the following three basic qualifications: hold Senior Member grade at the time the nomination is submitted; be an 'active' member (that is, dues must be current); and must have completed five years of service in any grade of IEEE membership. Note: IEEE affiliate membership within an IEEE society does not apply."

Almost anyone can serve as a nominator of a candidate for IEEE Fellow grade; you do not even have to be an IEEE member. But, for perhaps obvious reasons, the following cannot be nominators: members of the IEEE Board of Directors, members of the IEEE Fellow Committee, chairs and members of IEEE Technical Society/Council Fellow Evaluating Committees, or IEEE Staff.

A nomination must be supported by at least five, but no more than eight references from active IEEE Fellows. A list of IEEE Fellows can be found at the IEEE Fellow Program Web Site or in the current IEEE Membership Directory. In addition, a Fellow Nomination Resource Center (FNRC) was established. The purpose of the Center is to assist nominators in locating the required number of references to support a nomination to IEEE Fellow Grade. The Center will operate on an experimental basis for a 3-year period. It is a volunteer support group comprised of a Chair and Case

Managers, all of whom must be IEEE Fellow grade members. Nominators wishing assistance from the FNRC must initiate a request by sending an e-mail to [FNRC@ieee.org](mailto:FNRC@ieee.org).

For 2005, the following NPSS members were first evaluated by the NPSS Fellow Committee and elected IEEE Fellows: Shu T. Lai, Irvin R. Lindemuth, Yitzhak Maron, Lloyd W. Massengill, Stanley O. Schriber, and Benjamin M. W. Tsui. Also, the following NPSS members were first evaluated by other IEEE societies and elected IEEE Fellows: Robert C. Baumann, Akira Mizuno, and Bruce P. Strauss. Their biographical sketches and descriptions of their accomplishments appeared in the March 2005 NPSS Newsletter. Congratulations to our new fellows!

I want to thank Ron Jaszczak for serving last year as Chair of the NPSS Fellows Evaluation Committee. Under Ron's guidance, the committee did a superb job as evidenced by the election of six new fellows!

Recognizing the achievements of its members is an important part of the mission of the IEEE. Being elected an IEEE Fellow was important to me and one of the proudest moments of my career.

On behalf of the NPSS Fellows Evaluation Committee, we urge you to consider making an IEEE Fellow nomination in 2006.

*Peter S. Winokur, Chair, NPSS IEEE Fellows Evaluation Committee can be reached at the National Nuclear Security Administration, Washington, DC; Phone: +1 202 586 5480; E-mail: [p.winokur@ieee.org](mailto:p.winokur@ieee.org).*

## AWARDS

### Davidson and Roser Receive 2005 Particle Accelerator Science and Technology Awards



**Ron Davidson**

Since 1965, the IEEE Nuclear and Plasma Sciences Society has sponsored the biennial Particle Accelerator Conference. PAC2005 has continued this tradition with a meeting in Knoxville, Tennessee from May 16-20. In addition to the usual technical sessions and awards, PAC2005 included a celebration of the World Year of Physics and a special remembrance of the founding conference in 1965.

A Particle Science and Technology Award has been presented since 1989 at the Particle Accelerator Conference to honor outstanding

contributions to particle accelerator technology. 2005 winners are Dr. Ronald C. Davidson, Professor of Astrophysical Sciences at Princeton University and Dr. Tomas Roser, Associate Chair for Accelerators and Accelerator Division Head at the Collider-Accelerator Department of Brookhaven National Laboratory.

Dr. Davidson obtained a Ph.D. in 1966 from Princeton University. He held a research position at Berkeley for two years after which he served on the faculties of the University of Maryland (1968 - 1978), Massachusetts Institute of Technology

(1978-1990) and Princeton University (since 1991). He served as Director of the MIT Plasma Fusion Center from 1978 until 1988. From 1991 until 1996 he was Director of the Princeton Plasma Physics Laboratory. This award celebrates his contributions to the understanding of intense charged particle beams, a field in which he has contributed fundamental papers throughout his career. This work in plasmas and beams is the subject of four of his books in addition to ~370 publications and numerous conference contributions. He has supervised 23 students to their Ph.D.

Dr. Davidson has served the community in many ways including numerous government panels and the committees of professional societies. In particular we note his service to the accelerator community as Chair (2001-2) of the APS Division of Physics of Beams which since 1995 has co-sponsored the Particle Accelerator Conference.

Dr. Davidson is cited "For pioneering contributions to the theory of charged particle beams with intense self fields, including fundamental studies of nonlinear dynamics and collective processes."

Dr. Roser obtained his Ph.D. from ETH, Zurich in 1984. He joined the Spin Physics Center at the University of Michigan in 1984 and was appointed an Assistant Professor in 1990. He was involved in the acceleration on polarized protons at BNL, Indiana University Cyclotron Facility and UNK in Russia. In 1991 he accepted a position at the Brookhaven National Laboratory where he was most recently promoted to Senior Physicist in 1999.

He has been involved in the development and operation of the AGS and RHIC facilities including high intensity proton, heavy ion and polarized proton operation. He has documented his work in more than 40 journal papers and more than 165 conference papers.

Resonance depolarization is a significant barrier to the acceleration of polarized protons in a high energy synchrotron or storage ring. The most versatile and powerful technique currently available for controlling these effects is various forms of the "Siberian Snake" concept. Dr. Roser has played a leading role in many implementations and developments of this concept, including ones in the AGS and RHIC rings as demanded for collisions of high energy polarized protons at RHIC. He is also recognized for his leadership role in many other aspects of the polarized proton project.

Dr. Roser is cited "For pioneering scientific work and introduction of new technology in the acceleration, storage and collision of polarized protons in the high energy collider RHIC."

For further information use these links: Particle Accelerator Science and Technology Award (PAST Award) and Particle Accelerator Conference (2005 PAC)

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**Tomas Roser**

## ARTICLES

**Ed. note:** The following was submitted to me by Peter Clout. It is from a LANL blog and resonated with a number of people: Comments are always welcome!

The current LANL management team certainly seems to have mishandled their assignment, but in all fairness, managing a lab full of scientists is never easy, and no director is going to make everyone happy. Scientists taken as a group (though individuals vary, of course) have several characteristics which tend to make them harder than average to manage successfully:

a) They are experts in their own field, and often think that automatically makes them experts in other fields, when it doesn't. They would readily see the absurdity of, say, an experienced industrial program manager

undertaking to design a nuclear weapon, but don't see the equal absurdity in thinking that they could better manage their own large development programs without professional help. There is a tendency among many scientists to think that by virtue of their extensive training and expertise they know best, both inside their field of expertise and outside of it. A study of the history of science might introduce just a dash of humility to this view, but few scientists study such "irrelevant" fields.

b) As others in this blog have commented, there is often a level of arrogance mixed

## Who was he?

His is not fond of American Physicists in general on account of their tendency to do a great deal of boasting about very little.

*Ernest Walton*

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## Not mine!

My reputation as a dramatist grows with every play of mine that is not performed.

*George Bernard Shaw*

with naiveté. One blog poster, for example, asserted that a PhD in physics is the hardest PhD to earn (I presume because this poster has also earned PhDs in biochemistry, mathematics, history, and linguistics, among others and can make a comparison...). Many posters seem naively to assume that no one else is really up to the intellectual level of the LANL scientific staff, and certainly not anyone at Sandia or UT or in any of the likely industrial partners, and this is not that uncommon a view among scientists at large. It often doesn't seem to occur to scientists that there are many, many other fields every bit as complex and demanding as their own, and that some of those working in those fields are every bit their intellectual equals.

- c) Many good scientists have the "Feynman" tendency to resent authority and imposed structure on general principles, whether it makes sense or not. In fact, the ability to think outside the box and question established views is one of the strengths of a good scientist, and one certainly doesn't want to extinguish it, but at the same time it often does make scientists hard to manage as a group.
- d) Many scientists (though by no mean all) are largely oblivious to much of the world outside their own field of study, and hence don't really understand or value those around them who make their own work possible – such as the mechanics and machinists who build their experimental equipment, the upper managers who play the political games in Washington to assure their budgets (arguably a far more complex and difficult field than simple physics!), the

IT folks who keep their computer networks running, and the vast support staff who deal with the legal issues, the purchasing issues, the building maintenance issues, etc. etc. There is a tendency among scientists (actually, among academics in any field) to look down on these people as a "lesser breed," and to resent any process they might have put in place to make their own jobs possible. This tends to make it difficult for many scientists to work well in large organizations of any kind, whether it is a research lab or not – and by the way, it breeds a lot of resentment among all those undervalued and underappreciated support people who work hard to support the scientist's efforts.

So I would urge the LANL staff to back off a bit from all the personal attacks on current, past, and possible future lab managers, and understand that managing a large group of highly individualistic scientists is going to be hard for anyone to do, and no director and no university sponsor or industrial partner is going to make everyone happy.

In the end, as one recent blog poster noted, no one is going to come in and "save" LANL -- LANL is going to have to save itself, and that will have to start with the whole staff pulling together as a team toward the common goal of restoring LANL to its previous glory, rather than bitching and bickering and backstabbing each other, as has happened rather too often in this blog.

It would be nice to see some constructive discussion start on this blog, focused on what LANL [Ed. comment – and other labs] needs to do from this point forward to succeed, rather than on rehashing the sins of the past.

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## Mathematical clarification

Your problem is not your notations, but your notions.

*K.F. Gauss*

## Engineering a Better Future

**Rob Barnett**

**From IEEE-USA Today's Engineer, April 2005**

**T**he United Nation's millennium development goals (MDGs) are an ambitious set of goals (see Table 1) aimed at reducing poverty and improving the lives of people living in the world's least developed countries. Thanks mostly to the occasional endorsement by celebrities like Bono, front man for legendary Irish rock band U2, this notion of helping the world's poorest people has gained some notoriety in recent years.

Earlier this year, while addressing the World

Economic Forum (WEF) in Davos, Switzerland, Bono challenged, "we'll be remembered for three things right now: the internet, the war against terror, and what we did or didn't do about the glorious continent of Africa and its travails. And I think we can be the generation that ends extreme poverty."

Regina Clewlow, of Engineers for a Sustainable World (ESW), agrees with Bono. "Our goal is to engage engineers to address global poverty and sustainable development issues," said Clewlow.

## THE MILLENNIUM DEVELOPMENT GOALS

**Table 1: The United Nations Millennium Development Goals**

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Policy-makers have set some rather ambitious timelines for most of the goals shown in Table 1. Not surprisingly though, poverty alleviation is more than an economic challenge, and without the serious attention of scientific and engineering minds, it is unlikely that the MDGs will be met.

Presently, more than one billion people in the world live on less than one dollar per day, and many of these same people lack access to safe drinking water and proper sanitation. Embedded within the MDGs is the desire to reduce by half the number of people who lack access to safe drinking water by the year 2015. Senate Majority leader Bill Frist, who is also a doctor, addressed this very issue at the WEF. "There are 1.1 billion people today who don't have access to clean water, and the continent of Africa is an epicenter for that — right now 10,000 kids die every day [from lack of access to clean water]. I hope this becomes a major issue for all of us," said Frist.

To put Frist's challenge in perspective, it would require that infrastructure be put in place at a pace that would provide potable drinking water and other services for an additional 70 million people every year if the 2015 goal is to be met. The sheer magnitude of this problem is daunting, but Clewlow emphasized that engineers had to focus on solutions that were relevant to the environment they are working in. For example, advanced water purification technologies like those found in the United States are not always appropriate in remote parts of the world.

Combating HIV/AIDS is also at the top of the list of the MDGs. Specifically, policy-makers would like to halt the spread of HIV/AIDS by 2015. Through the Bill and Melinda Gates Foundation, Microsoft Chair Bill Gates has been a leader on this issue. "It's ironic at the time where science is advancing and we have

this great resource of medical understanding that we've allowed the AIDS epidemic to get truly out of control — particularly in Africa," said Gates at the WEF.

### SOLUTIONS TO THE PROBLEMS

Although almost all of the MDGs require the skills of some type of engineering, some goals specifically require insights from computer and electrical engineers. For example, access to modern energy resources is considered an essential prerequisite for improving peoples' lives. At present, nearly two billion people in mostly rural areas lack access to modern energy services.

Engineers and policy-makers agree that developments in off-grid power systems, distributed energy resources, and renewable power sources can help to provide much of the electrification effort. Although more focused on domestic issues, IEEE-USA's Energy Policy Committee (EPC) has taken proactive stances on many of these energy issues, while acknowledging that "nations with the highest electricity generating capacity tend to have the highest gross domestic product per capita." [[www.ieeeusa.org/policy/positions/electrification.asp](http://www.ieeeusa.org/policy/positions/electrification.asp)]

Other organizations, such as ESW take more of a grassroots approach to development issues. ESW organizes roughly 30 to 50 projects each year that place engineers on the ground in developing countries. Recent projects have included water resource development efforts in Honduras, which involve the efforts of computer scientist and computer engineers to develop control mechanisms for the water system. ESW has also worked in Yugoslavia to develop computer science curricula and increased access to the Internet.

### TSUNAMI RELIEF

In February, the United Engineering Foundation (UEF), of which the IEEE is a member, contributed \$25,000 to the engineering community's collaborative efforts to rebuild schools and other infrastructure destroyed by the Indian Ocean tsunami on 26 December 2004. The engineering community's efforts in the devastated region are being spearheaded by Engineers Without Borders-USA (EWB-USA), a group that partners with disadvantaged communities to improve their quality of life through implementation of environmentally and economically sustainable engineering projects, while developing inter-

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## Life's lesson

Love is what we were born with. Fear is what we learned here.

*Marianne Williamson*

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## Tart thought

The upper crust is a bunch of crumbs held together by dough.

*Old saying*

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## Left field

[Applied mathematics consists of] those areas of physics in which physicists are no longer interested.

*Kurt Friedrichs*

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## Aladdin, please stay away

If man could have half his wishes, he would double his troubles.

*Benjamin Franklin*

nationally responsible engineering students [[www.ieeeusa.org/communications/releases/2005/uef-022205.asp](http://www.ieeeusa.org/communications/releases/2005/uef-022205.asp)].

With the help of organizations that shape policy, such as the IEEE-USA, and more hands-on engineering organizations such as ESW and EWB-USA, there can be some optimism that UN's MDGs might actually be achieved. As Bono said, "we can be the generation that ends extreme poverty."

## IEEE-USA White Paper: U.S. Prosperity at Risk; Gigabit Networks Should be National Priority

**WASHINGTON (08 April 2005) — The United States should deploy widespread wired and wireless gigabit networks as a national priority, according to a white paper from the IEEE-USA Committee on Communications and Information Policy (CCIP).**

"Providing Ubiquitous Gigabit Networks in the United States," issued 14 March, says that our nation must act promptly to ensure that a new generation of broadband networks — of gigabit per second speed — is ubiquitous and available to all. Failure to act will "relegate the U.S. telecommunications infrastructure to an inferior competitive position" and undermine the future of the U.S. economy.

"Priority deployment of gigabit networks is essential for the United States to maintain its world leadership in the knowledge economy," IEEE Life Fellow and IEEE-USA CCIP member Dr. John Richardson said. "Information drives our lives and our prosperity. The problem is that current networks aren't fast enough to distribute that information properly."

Digital data rates, or speeds, are typically expressed as megabits per second (Mb/s) or gigabits per second (Gb/s). A megabit is one million bits; a gigabit is one billion bits. Current broadband networks, such as DSL or cable modems, have an asymmetric speed of about 2 Mb/s. Gigabit networks are capable of digital rates 50 to 5,000 times as fast, with equal upstream and downstream speed. Symmetric speed means information can be downloaded and uploaded at the same rate. With asymmetric systems, upstream speeds lag behind downstream delivery rates.

Omnipresent U.S. gigabit networks, readily achievable by deploying optical fiber and

### FOR MORE INFORMATION

- Engineers for a Sustainable World: [www.esustainableworld.org](http://www.esustainableworld.org)
- United Nations Development Goals: [www.undp.org/mdg](http://www.undp.org/mdg)
- Columbia Earth Institute: [www.earthinstitute.columbia.edu](http://www.earthinstitute.columbia.edu)
- Engineers Without Borders-USA: [www.ewb-usa.org](http://www.ewb-usa.org)

high-speed wireless, would carry numerous benefits. These include providing the U.S. economy with superior ability to compete globally; stimulating economic activity in digital home entertainment; enhancing online education and training; and facilitating health care remote diagnosis and consultation (telemedicine).

Congress, the Executive Branch and private-sector initiatives could secure these benefits for our nation's global competitiveness and quality of life by adopting "principles leading to ubiquitous, symmetric gigabit availability as a national priority," according to the CCIP white paper ([www.ieeeusa.org/volunteers/committees/ccip/docs/Gigabit-WP.pdf](http://www.ieeeusa.org/volunteers/committees/ccip/docs/Gigabit-WP.pdf)). Such principles include regulatory flexibility and encouragement of user-owned networks.

"The key fact of modern telecommunications is the convergence of voice, data, image and video into digital bit streams," said Richardson, a former chief scientist at the National Telecommunications and Information Administration. "We need faster networks to carry these bit streams to users. Broadband speed and penetration in the United States are pitiful compared to levels in Japan and South Korea. This means that U.S. prosperity is at risk because it depends, in large part, on fast and easy exchange of information."

IEEE-USA is an organizational unit of the IEEE. It was created in 1973 to advance the

public good and promote the careers and public policy interests of the more than 220,000 technology professionals who are U.S. members of the IEEE. The IEEE is the world's largest technical professional society. For more

information, go to [www.ieeeusa.org](http://www.ieeeusa.org).

*For further information, please contact: Chris McManes, Senior Public Relations Coordinator; Phone: + 1 202 785 0017, ext. 8356; E-Mail: [c.mcmanes@ieee.org](mailto:c.mcmanes@ieee.org)*

## Ambivalence

Those who favor taking the anthropic principle seriously don't really like it, and those who come out against it recognize that it may be unavoidable.

*Steven Weinberg*



### INVESTIGATING THE FUNDAMENTAL NATURE OF MATTER

The community of physicists and engineers represented by the Particle Accelerator Conference and the Particle Accelerator Science and Technology Committee provide the beams of particles that the nuclear and high-energy physics experiments need for their research. Attendees of the Nuclear Science Symposium, organized by the Radiation Instrumentation Committee, develop the detectors that are used to detect and characterize the particles resulting from the interactions, leaving the analysis to the nuclear and high-energy physicists.

### DEVELOPING ENERGY SOURCES AND THE EFFICIENT USE OF ENERGY

No one can question the importance of a reliable and low-cost energy supply. Sessions in the Nuclear Science Symposium are devoted to nuclear power systems and the Symposium on Fusion Engineering and the Fusion Technology Committee are devoted to the development of Fusion Power. The International Conference on Plasma Science and the Plasma Science and Applications Committee are devoted to all aspects of plasmas including efficient lighting, material processing, and many other applications. Power sources for many applications, including particle accelerator, fusion, plasma, and hydrodynamics systems are the focus of the Pulsed Power Conference and the Pulsed Power Science and Technology Committee.

### HEALTH CARE

The Medical Imaging Conference, organized by the Nuclear Medical and Imaging Sciences Technical Committee, provides a forum for the presentation of new concepts and developments in nuclear medical technology. This has significantly impacted new developments in medical diagnosis. The technology has evolved

into health care systems using positron emission tomography (PET), single photon emission computed tomography (SPECT), X-ray computed tomography (CT), mammography, and digital radiography systems, all of which are based on radiation detection systems and reconstruction algorithms developed by the community of the NPSS Medical Imaging Conference (MIC). Cancer treatment with particle beams requires particle accelerators, the subject of the Particle Accelerator Conference community. The International Conference on Plasma Science also has sessions on medical and biological applications.

### PROBING THE UNIVERSE AND EXPLOITING SPACE

The extreme reliability required of electronics in a high radiation environment is the reason for the Nuclear and Space Radiation Effects Conference, organized by the Radiation Effects Committee, the European Conference on Radiation and its Effects on Components and Systems. In addition, the Nuclear Science Symposium has astrophysics detector sessions.

### DATA HANDLING AND SEMICONDUCTOR DEVELOPMENT

New technologies in all these areas need the highest performance data capture and processing involving electronics and specialized computer hardware and software. The Real-Time Conference organized by the Computer Applications in Nuclear and Plasma Science Technical Committee covers all these aspects as well as the International Conference on Accelerator and Large Experimental Physics Control Systems. The work of the community of researchers represented by the Nuclear and Space Radiation Effects Conference adds to the reliability of semiconductors for everyone; for example, making semiconductor memory errors almost a distant memory.

Join Us! FOR FURTHER INFORMATION VISIT: [www.ieee-npss.org](http://www.ieee-npss.org)



## Follow through

Suffice it to say that testing can only reveal problems, not fix them.

*Jim Hart*

## 2005 Nuclear and Plasma Sciences Society

### Administrative Committee

President	William W. Moses
Vice President	Jane M. Lehr
Secretary	Alberta M. Dawson Larsen
Treasurer	Edward J. Lampo
Most Recent Past President	Peter S. Winokur
Division IV Director	Stuart A. Long

### Elected Administrative Committee Members

Terms expiring 2005: Dennis B. Brown (RE), Mounir Laroussi (PSAC), Patrick LeDû (CANPS), William W. Moses (RI)

Terms expiring 2006: Joseph Benedetto (RE), Grant Gullberg (NMIS), Glenn F. Knoll (RI), Patrick O'Shea (PAST)

Terms expiring 2007: Steven H. Gold (PSA), Allan H. Johnston (RE), Jane M. Lehr (PPST), Charles L. Neumeyer (FT)

Terms expiring 2008: Uwe Bratzler (Transnational), Christopher Deeney (PSA), Ronald J. Jaszczak (NMIS)

### Technical Committee Chairs

Computer Applications in Nuclear and Plasma Science (CANPS): Jean-Pierre Martin; Radiation Instrumentation (RI): Craig Woody; Fusion Technology (FT): Philip J. Heitzenroeder; Nuclear Medical and Imaging Sciences (NMIS): Magnus Dahlbom; Particle Accelerator Science and Technology (PAST): Ilan Ben-Zvi; Plasma Science and Applications (PSA): Daniel O. Jobe; Pulsed Power Science and Technology (PPST): Gerald Cooperstein; Radiation Effects (RE): Ronald D. Schrimpf.

## Functional Committee Chairs

Awards: Igor Alexeff; Chapter and Local Activities: Vernon G. Price; Communications: Peter N. Clout; Fellow Candidate Evaluation: Peter S. Winokur; Finance: Harold Flescher; Conference Policy: Raymond S. Larsen; Membership: Vernon G. Price; Nominations: Peter S. Winokur; Publications: Paul V. Dressendorfer; Standards: Ronald M. Keyser; Students & Careers: Edl Schamiloglu & Kenneth A. Connor; Transnational: Uwe Bratzler.

### Publications

Editor-in-Chief: Paul V. Dressendorfer; Editor, IEEE Transactions on Nuclear Science: Paul V. Dressendorfer; Editor, IEEE Transactions on Plasma Science: Steven J. Gitomer; Editor, IEEE Transaction on Medical Imaging: Max A. Vieregger; Conference Editors, Transactions on Nuclear Science: Zane Bell; John Cressler; Joel Karp; Jean-Pierre Dufey; Editor, Newsletter: Albe Dawson Larsen; Editors Emeritus: W. Kenneth Dawson, John F. Osborn.

### Liaison Representatives on other IEEE Committees

Coalition for Plasma Science: Gerald L. Rogoff; Distinguished Lecturer Program: Charles Neumeyer; Energy Policy: Richard Lanza and Charles Neumeyer; R&D Policy: Vacant; PACE: Julian Forster; RADECS Liaison: Harold Flescher; Sensors Council: Anthony D. Laviertes; Social Implications of Technology: Raymond S. Larsen; Standards: Julian Forster and Michael Unterweger; TAB New Technology Directions: TMI: A Bertrand Brill and Ronald J. Jaszczak. Medical: Benjamin M. W. Tsui.

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