

Nuclear & Plasma Sciences

Number 2 • June 2009

SOCIETY NEWS

CONFERENCES

NUCLEAR AND SPACE RADIATION EFFECTS CONFERENCE NSREC 2009 Québec City, Québec, Canada July 20-24, 2009

The 46th annual IEEE International Nuclear and Space Radiation Effects Conference (NSREC) will be held July 20-24, 2009 in Québec City, Canada, at the Québec Hilton and Québec City Convention Centre. We will continue the tradition of previous NSRE Conferences by offering an outstanding Technical Program, a one-day Short Course, a Radiation Effects Data Workshop, and a sold-out Industrial Exhibit. Engineers, scientists and managers from around the world who are interested in radiation effects will attend. Mark Hopkins, The Aerospace Corporation, is the chairman.

A complete technical and social program is being planned to maximize opportunities for information exchange and networking in the area of radiation effects on microelectronic and photonic devices, circuits, and systems. Supporters of the conference include the Defense Threat Reduction Agency, Sandia National Laboratories, Air Force Research Laboratory, and the Jet Propulsion Laboratory. NSREC also has corporate supporters: BAE Systems, Boeing,



Micro-RDC, Honeywell, Northrop Grumman, and Aeroflex Colorado Springs. Additional information on the conference is available on the Web at <http://www.nsrec.com>.

TECHNICAL PROGRAM

The Technical Program Chairman, Lew Cohn from NRL, and his committee, have assembled an outstanding set of contributed papers that are arranged into nine 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 techniques and radiation test facilities. In addition, there are three invited talks of general interest to both conference attendees and their companions.

Ken LaBel has organized this year's Short Course with a theme of "Selection of Integrated Circuits for Space Systems" which will be held Monday, July 20. This Short Course is an excellent learning opportunity

continued on page 3



Mark Hopkins
General Chairman



Lew Cohn
Technical Program
Chair



Ken LaBel
Short Course
Organizer



David Hiemstra
Local Arrangements
Organizer

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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 10, 2009 for publication in the September 2009 Newsletter.

CONTRIBUTED ARTICLES

News articles are actively solicited from contributing editors, particularly related to important R&D activities, significant industrial applications, early reports on technical breakthroughs, accomplishments at the big laboratories and similar subjects.

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

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

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for 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 is organized into six sessions starting with a systems engineering and management perspective for part selection. The second through fourth sessions detail technical considerations: radiation, reliability, and design performance. Finally, two examples will be provided focusing on advanced digital and mixed signal applications, respectively.

INDUSTRIAL EXHIBITS

This year's Industrial Exhibits, organized by Laura Burcin from BAE Systems, will permit one-on-one discussions between conference attendees and exhibitors on the latest developments in radiation-hardened and radiation-tolerant electronics, engineering services, facilities, and equipment. On Tuesday evening, attendees and their companions are invited to a reception that showcases the Industrial Exhibit. If you need more information on the exhibit, please visit <http://www.nsrec.com>. The exhibitors are as follows.

3D Plus – USA
Actel Corporation
Aeroflex Colorado Springs
AFRL/VSSE
Atmel
BAE Systems
Boeing
C-MAC MicroTechnology
CORWIL Technology Corporation
Crane Aerospace & Electronics
Cyclotron Institute, Texas A & M University
Defense Microelectronics Activity (DMEA)
Honeywell
International Rectifier
Intersil Corporation
JD Instruments
J. L. Shepherd & Associates
Lawrence Berkeley National Laboratory
Maxwell Technologies
Micro-RDC
Microsemi Corp.
Modular Devices Inc.
M.S. Kennedy Corporation
National Semiconductor
Northrop Grumman Corporation
Peregrine Semiconductor Corp.
Prairie View A&M – NASA
Radiation Assured Devices
Robust Chip
Sandia National Laboratories

Silvaco International
Space Micro
Teledyne
U.S. Semiconductor
Ultracomm
Vanderbilt University ISDE
Viasic, Inc.
White Sands
Xilinx

SOCIAL EVENTS

Social events have been planned to give conference attendees and their guests many opportunities to informally discuss business and to become better acquainted. Local Arrangements Chairman, Dave Hiemstra from MDA Space Missions, has planned a fun and memorable social program. The main conference social on Wednesday night will be a dinner cruise aboard the Louis Jolliet on the St. Lawrence River. The cruise provides a unique perspective of the city, the river and many of the surrounding landmarks. Additional excursions during the week include tours of the city's historic district, Montmorency Falls and the Île d'Orléans.

QUÉBEC CITY, QUÉBEC

Québec City is the capital of the Canadian province of Québec. Québec City's Old Town is the only North American fortified city north of Mexico whose walls still exist and was declared a World Heritage Site by UNESCO in 1985 as the "Historic District of Old Québec." It is also one of the oldest cities in North America. Québec City is internationally known for its Summer Festival and the Château Frontenac, an historic hotel which dominates the city skyline. The chief of Parliament, the National Assembly of Québec, the National Museum of Fine Arts and the Museum of Civilization are found within or near Québec City's Old Town. Among the tourist attractions near the city are Montmorency Falls, the Basilica of Sainte-Anne-de-Baupré in the town of Sainte-Anne-de-Baupré, and the Île d'Orléans. Conference attendees and companions will enjoy this historic city's European nature, culture, and fine food.

INVITED SPEAKERS

NSREC has three exciting guest speakers. First on Wednesday is Québec: World Heritage City, Barry Lane, Canadian Cultural Landscapes. On Thursday is Combating Cyber Crime: A New

Virtual reality
The coding of programs has long been indirect, using coding schemes that make a virtue of their distance from the reality of the machines on which they will run.

Neville Holmes



Teresa Farris
VP Publicity

Canadian Cyber Forensic Organization Created to Fight Cyber Crime, Mourad Debbabi, Concordia University and the final speaker on Friday is The Road that Walks, A History of Travel on the St. Lawrence River, David Mendel, Canadian Cultural Landscapes.

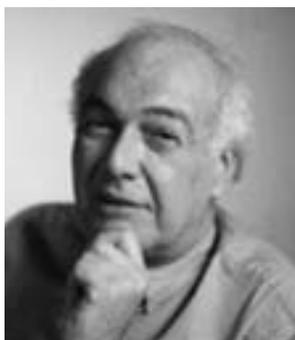
For the latest NSREC information (technical program, conference and social registration

forms, hotel and travel information, etc.) please visit our web site at <http://www.nsrec.com>.

The General Chair, Mark Hopkins, can be reached at The Aerospace Corporation, at (505) 872-6201 or E-mail: mark.a.hopkins@aero.org.

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2009 IEEE NUCLEAR SCIENCE SYMPOSIUM AND MEDICAL IMAGING CONFERENCE Hilton Hotel – Walt Disney World Resort Orlando, Florida, USA October 25–31, 2009 www.nss-mic.org/2009



Richard Lanza
General Chair

The 2009 IEEE Nuclear Science Symposium and Medical Imaging Conference, will be held from October 25–31 in Orlando, Florida at the beautiful Hilton Hotel in the Walt Disney World Resort. This joint meeting offers a great opportunity to exchange new knowledge and ideas in nuclear science and medical imaging with friends and colleagues from across the world. We are planning a strong program of relevant short courses, an integrated program of workshops, a Special Session on Women in Engineering, an Industrial Program (Exhibits), and an exciting and unique Companion Program that will include the NASA Space Center at Cape Kennedy and Disney World.

The final call for papers has been issued and the deadline for abstract submission was 11 May 2009. Please go to the Conference web-site, www.nss-mic.org/2009 for current information and hotel reservations.

Nuclear Science Symposium 25–31 October 2009: The Nuclear Science Symposium (NSS) offers an outstanding opportunity for scientists and engineers interested or actively working in the fields of nuclear science, radiation instrumentation, software development and their applications to space, accelerators, other radiation environments, and homeland security to meet and share information. Authors are invited to submit papers describing original unpublished work in a broad range of relevant topical areas. Examples include:

- Accelerators and Beam Line Instrumentation
- Analog and Digital Circuits
- Astrophysics and Space Instrumentation
- Computing and Software for Experiments
- Instrumentation for Homeland Security
- Neutron Imaging and Radiography
- New Detector Concepts and Instrumentation
- Nuclear Measurements and Monitoring Techniques
- Photodetectors and Radiation Imaging Detectors
- Trigger and Front-End Systems

For a complete list of topical areas and specific details, please visit the conference web site.

Medical Imaging Conference 25–31 October 2009: The Medical Imaging Conference (MIC) is the foremost international scientific meeting on the physics, engineering and mathematical aspects of nuclear-medicine-based imaging. The MIC reflects this through a growing emphasis in X-ray, optical and MR imaging as they relate to nuclear imaging techniques. Authors are invited to submit papers describing original and innovative contributions to the field. Examples include:

- Emission Tomography Instrumentation (PET, SPECT)
- Multi-modality Systems
- High Resolution & Animal Imaging Instrumentation and Techniques
- Intra-operative Probes & Portable Imaging Systems
- Image Reconstruction Methods

- Reconstruction Methods
- Quantitative Imaging Techniques
- X-ray Imaging & X-ray Computed Tomography
- Non-Nuclear Technologies for Molecular Imaging (CT, MR, Optical Imaging)

For a complete list of topical areas and for specific details, please visit the conference web site.

On behalf of the organizing committee and the IEEE Nuclear and Plasma Sciences Society,

I encourage you to make plans now to attend this year's Nuclear Science Symposium and Medical Imaging Conference and look forward to welcoming you to Orlando.

Richard Lanza, General Chair, can be reached at the Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Ave., Room NW13-221, Cambridge, MA 02139. Conference e-mail: ns-smic2009@mit.edu.

5TH INTERNATIONAL SUMMER SCHOOL ON NUCLEAR PHYSICS METHODS AND ACCELERATORS IN BIOLOGY AND MEDICINE

Bratislava – Slovakia, 6–15 July 2009

The Summer School is devoted to current topics and new developments in the principles and methods of Nuclear Physics and Accelerators with applications to Biology and Medicine. This event is part of a School Series held every two years within the framework of the long-term cooperation between JINR Dubna and its Member States in Central and Eastern Europe. Initiated by the University Center of the JINR Dubna, AMU Poznan and the CTU in Prague, the previous Schools were held in Dubna (2001), Poznan (2003), Dubna (2005) and Prague (2007). This year's School will be held at the Comenius University in Bratislava from the 6th–15th July 2009, and will follow a plan similar to that of the successful Prague School (www.utef.cvut.cz/4SummerSchool), where the program was arranged into Plenary Courses and Advanced Lectures, with a number of specialized Speakers contributing about 10 Plenary Course Manuscripts and over 30 Short Papers for the School's Proceedings, which were published by the American Institute of Physics Conference Series. From the nearly 100 students attending, most of whom presented their own research as a Short Talk or Poster, about 40 student contributions were included as short papers in the Proceedings.

The School program this year focuses on Particle Accelerators, Radiation Detectors, Hadron Therapy and Nuclear Medical Imaging. Particular emphasis is placed on the physical principles and methods in an introductory, explanatory way. The list of Speakers includes leading experts in their fields: William Moses, Lawrence Berkeley Labo-

ratory, and IEEE NPSS Distinguished Lecturer (Nuclear Medicine), Erik Heijne, CERN, and IEEE NPSS Distinguished Lecturer (Position Sensitive Detectors), and Claude Leroy, University of Montreal (Radiation Detectors). Ideal participants are MSc and PhD students majoring in Engineering, Physics or Medicine as well as young researchers working in fields related to the topics of the School. The Proceedings of the School will be published by the AIP. The detailed program is announced on the School's website (www.fmph.uniba.sk/~5SummerSchool).

The School is co-organized by the Faculty of Mathematics, Physics and Informatics of the Comenius University in Bratislava, the Joint Institute for Nuclear Research JINR Dubna and the Institute of Experimental and Applied Physics of the Czech Technical University. The School is supported by all co-organizing institutions and by the Slovak Physical Society, the Slovak Nuclear Society, the Ministry of Education of Slovakia, the Electrotechnical Research and Projecting Institute Slovakia, and by Grants of Government Plenipotentiaries of Czech Republic, Poland and Slovakia in JINR Dubna. The organizers are also happy to have for the first time the Technical Co-Sponsorship of the IEEE NPSS. This initiative is one product of the 2008 IEEE NSS-MIC Dresden Conference together with the newly formed NPSS Chapter of the IEEE Czechoslovak Section (www.ieee.cz/nps).

Carlos Granja, Organizing Committee, IEAP CTU Prague, can be reached by e-mail at granja@mail.utef.cvut.cz.

Who was...
... adept at giving indirect but suitable answers to direct but unsuitable questions.

Hesketh Pearson



Carlos Granja

CONFERENCE REPORT

WORKSHOP ON HYBRID IMAGING WITH MR-PET

Forschungszentrum Jülich, Germany

October 27–28, 2008

Held in conjunction with the 2008 IEEE NSS/MIC/RTSD



Dr. Hans Herzog
Organizing Committee

Combinations of imaging modalities that integrate the strengths of two modalities, and at the same time eliminate one or more weaknesses of an individual modality, offer the prospect of improved diagnostics, therapeutic monitoring, and preclinical research. This explains the recent success of PET/CT and SPECT/CT systems that are playing an increasingly important role in the diagnosis and staging of human diseases. Research groups have been developing MR-PET scanners for small animal imaging. In addition, the first prototypes of a commercial MR-PET scanner for simultaneous human brain studies have been built. New work using MRI has shown that tracking of targeted molecules, agglomerates and cells, can be performed with sufficient sensitivity, albeit with compromised spatial resolution. Thus, MR-PET delivers an unforeseen spectrum of useful combinations for basic research and clinical applications.

The present state, expectations and challenges of MR-PET were discussed by 165 participants from 20 countries during an international workshop at the Forschungszentrum Jülich, Germany, held in conjunction with and following the 2008 IEEE NSS/MIC/RTSD at Dresden, Germany, on October 27-28, 2008.

During the introductory lecture Torsten Kuwert (Erlangen) stressed that MR-PET opens a totally new horizon of multi-parametric imaging by exploiting the functional capabilities of both MRT and PET. However, before this vision will be fully realized a number of problems have to be solved that relate to the hardware and the methods involved, as discussed during the two days. Volker Schulz (Philips) described his company's two projects: a first non-hybrid MR-PET with the two modalities in line, and a later fully integrated hybrid scanner. Robert Krieg (Siemens) especially reviewed the functional features offered by future MRT in addition to its capability to image anatomy.

Bernd Pichler (Tübingen) gave a comprehensive overview of MR-PET scanner designs for imaging small animals. These ranged from

solutions with long fibres connecting the PET detector and its electronics, which was detailed later by Jane Mackewn (London), through MR-PET with split MRT, as later presented by Rob Hawkes (Cambridge), or MR-PET with cycled field MRT, to MR-compatible PET-detectors based on solid state readout electronics instead of photomultipliers. The 7 T MR-PET constructed at Tübingen uses non-magneto-sensitive avalanche photo diodes (APDs) as readout electronics and shows negligible interferences between PET and MRT. Matthias Schmand (Siemens) described how a similar design has been realized in the first commercial MR-PET scanner, which inserts a newly constructed BrainPET in a 3 T MRT. Chris Thompson (Montreal) indicated how this system's radial resolution may be improved by decreasing the depth-of-interaction (DOI) problem with dual layer crystals. This problem may be also circumvented by an LYSO-double-APD-based design suggested by Joan Varela (Lisbon), who plans to adapt a PET system dedicated for mammography (PEM) to work as a brain MR-PET.

Although APDs are found in current hybrid MR-PET, the lectures of Yong Choi (Seoul), Volker Schulz, Peter Bruyndonckx (Brussels) and Craig S. Levin (Stanford) made clear that silicon photomultipliers (SiPMs) offer better features so that many groups focus their research on this issue.

Dave Townsend (Knoxville) discussed the principal prerequisites needed for quantitative PET and that the different well-known corrections have to be adapted to the new detector technology of PET working in the MR environment. One primary correction is that for attenuation. As MR-PET does not offer a possibility for measured attenuation correction by transmission scans, new solutions must be found, as discussed by Elena Rota Kops (Jülich) and Gaspar Delso (München), who included this issue in his lecture on the advantages and challenges of whole-body MR-PET. The contribution by Johannes Breuer (Cologne) discussed how blood sampling necessary for



Karl Ziemons
Organizing Committee

quantitative PET modelling, as was later reviewed by Hidehiro Iida (Osaka), can be achieved within the MR environment.

The functional features of MRT are improved with an increasing magnetic field. The possibilities and challenges with ultra-high field MR-PET were finally presented by David Schlyer (Brookhaven), who plans to insert the RatCAP in a small animal 9.4 T MRT, and Jon

Shah (Jülich), who directs the project of 9.4 T MR-PET for human brain studies.

Following the success of this workshop there was general agreement to have an update within the next two years.

For further information on this workshop, please email Organizing Committee members Hans Herzog and Karl Ziemons at mr-pet@fz-juelich.de or visit www.mr-pet-juelich.de.

That's what you think
Nothing exists except atoms and empty space.
Everything else is opinion.

Democritus

NPSS GENERAL BUSINESS

PRESIDENT'S REPORT

The first part of 2009 has been a busy time for NPSS, and for me as President. It started off with our Society Review, which I mentioned in the last Newsletter. This full-scale, bottoms-up review of our entire Society, carried out by IEEE every five years, took place on February 12th at the TAB Meeting in San Juan, Puerto Rico. The review certainly went very well, and we came out of it with a great deal of praise for how we run our Society. In particular, our conferences and publications got very high marks, as well as how we handle our finances. Our Society remains extremely healthy and viable, and we still have substantial reserves to carry us through these difficult economic times.

We are also doing well expanding our international activities by holding more conferences outside the US, opening new Chapters abroad, and increasing international representation on our various committees. Our membership has remained fairly constant over a number of years, hovering around 3000, but does have some year-to-year fluctuations. One thing we would like to do is to try and retain the new members that join IEEE and our Society at each of our conferences, but often seem to drop out after the first year. This is something our new Membership Chair, Uwe Bratzler, is going to be working on, along with Christoph Ilgner, who is our new GOLD Committee Chair. We will also be working on trying to improve on strategic and long-range planning for our Society. We actually do a great deal of this already with our AdCom and in our Technical Committees, but more coordination in this area is always beneficial.

One of the main topics of discussion at the TAB meeting was the consequence of the current economic turndown on IEEE's reserves and finances. While the results of the economic situation have certainly had a negative impact, IEEE as a whole is still in good financial shape. However, IEEE's reserves have fallen below the level that allows Societies to initiate new programs using their own reserves. We used this process last year to initiate our new Marie Sklodowska-Curie Award, and it was therefore fortunate that we were able to implement this and obtain all the necessary approvals when we did. However, the current financial restrictions mean that we cannot plan for any new projects in 2009 that use our reserves. Another development reported at the TAB meeting was that the IEEE Board of Directors approved taking the Eta Kappa Nu Student Engineering Honor Society into the IEEE organization. This will benefit many engineering students and will encourage young engineers to become long-term members of IEEE.

I would also like to report on the activities of our last AdCom retreat and meeting held in Baltimore on March 6th and 7th. One area that we are moving into is using IEEE Meetings and Conference Management to help us with planning and organizing some of our conferences. We have been using their services in a limited way during the past year, and the results have been extremely beneficial. We are therefore hoping to make more use of these professional conference management services for more of our conferences in the future.

We also discussed updating our Field of Interest, which describes the broad range of technical interests we have within NPSS. One area



Craig Woody
NPSS President

**The former
for us
Everything is the
fruit of chance or
necessity.**

Democritus

we would like to move into is so-called electromagnetic launch technology, which could naturally become a part of our Pulsed Power Technical Committee. However, changing our Field of Interest is a rather formal procedure within TAB, since it may require negotiations with other Societies. We are also planning to review our entire Constitution and Bylaws next year, which would include a more complete revision of our Field of Interest. Our newly elected Vice President, Bob Reinovsky, will be heading the Committee that will be carrying out this review and revision.

A motion was made at the AdCom meeting for NPSS to drop out of the Biometrics Council, which we are a member of along with 17 other Societies working in the field of biometrics. Our initial interest in this Council was from our NMISC Committee, but there appeared to be very little actual overlap between our interests and what the rest of the Council was doing. However, after some discussion at the AdCom meeting, it became apparent that there was some new interest in this area from the Plasma Sciences Technical Committee involving the use of terahertz technology for biomedical applications. I'm therefore pleased to report that we will remain a member of this Council, with Dave Abe serving as our new representative. I would also like to thank Randy Brill and Ron Jaszczak for their service on the Council for the past several years.

Another action that was taken during the AdCom meeting was for NPSS to Technically

Co-Sponsor the Fifth International Summer School on Nuclear Physics Methods and Accelerators in Biology and Medicine, which will be held in Bratislava, Slovakia in July of this year. This is primarily a summer school for young students and scientists that are working on or are interested in nuclear physics applications for biology and medicine. More information on this meeting is given in this Newsletter. On a related subject, IEEE has now officially approved the new NPSS Chapter in Prague in the Czech Republic. We certainly welcome all of these new NPSS activities in this part of the world.

Finally, I would like to mention that if you haven't yet received a new NPSS survey questionnaire that is distributed to all of our membership, you will soon. One of the main purposes of the questionnaire is to apportion our AdCom seats so that each technical area is represented appropriately. However, it is also used to provide important feedback to our Society's leadership on how our members feel our Society is serving them. It is a valuable opportunity for everyone to let us know what they think about how we are doing and how we can improve our service to our community. I would encourage all of you to take a few moments and fill out this questionnaire to provide us with your valuable feedback.

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

SECRETARY'S REPORT



Albe Larsen
*IEEE NPSS Secretary
and Newsletter Editor*

In the above report, Craig Woody has addressed the highlights of our retreat and meeting in Baltimore, March 6th and 7th, so I will comment on a few other things before providing a bit more meeting detail. The first is that this is the first issue of our newsletter that is being handled through outsourcing the electronic layout. I admit to considerable trepidation about it, and hope that you won't find any degradation in quality. I attended the Panel of Editors meeting in Atlanta in early April to try to learn more about this. IEEE has been outsourcing layout of magazines and some journals for quite some time and they have had overall positive feedback. I am hoping our experience

will be the same. Printing has been outsourced for many years – in fact I doubt that there are too many of us left who remember that there was a press in the basement of the United Engineering building in Manhattan, the building in which the IEEE Publications Department was once housed before almost all IEEE offices were moved to Piscataway. Times change, and we have to change with them and, although we are an international organization, it still hurts, especially in this economy, to see more jobs sent overseas. Aside from this particular issue, the Panel of Editors meeting was interesting. The focus, of course, is on editing and producing journals, a large source of revenue for our

societies and for IEEE as a whole. The most fascinating presentation was the opening one that discussed web-based journal possibilities where journals were not merely viewed as print on the screen but which might include dynamic graphics that could show or explain part of an experiment or experimental set-up in a far more comprehensible way. The possibilities are endless and very exciting. The other presentations covered basics of the Pubs Department performance and so on. The breakouts for magazine and newsletter editors were less than they could have been and the representation from societies was very poor. There is a lot more I would like to know about newsletters in general and how other societies view them, but the reality is that they more often lose rather than make money and hence are only of interest in that they keep members informed of society activity.

Our financial picture has been discussed in the president's report. Our Division IV Director, Roger Sudbury, was able to be with us for this meeting. He discussed the makeup of the Division, which consists of two large societies and five small ones. Because of this, the Division Director comes, alternately, from a large society and then a small society. Note that our own Peter Clout, a past NPSS president, the chair of our Communications Committee and chief mover and shaker in getting those beautiful brochures and leaflets printed and in getting booths and posters to our conferences, as well as serving on IEEE's Society Review panel, among many other things, is a candidate for the next Division Director. You'll hear more about that in the next Newsletter, but remember that Peter will serve us well, so vote for him when the time comes!

Roger discussed the state of the IEEE in some detail, after outlining its 125-year history. IEEE finished 2008 fairly well, but was short of funds for the defined benefits program, so some society reserves will be tapped. While there has not been a hiring freeze at IEEE HQ, there has been a slowdown in hiring and the need for new employees must be well documented. The early 2009 conferences are being pressed to get reports in early. There is some indication of lower attendance, but the trend isn't really clear. While our society is financially sound and fiscally prudent, other societies have not managed as well. Some have revised their financial models and are now back on their feet and doing well. Others have been intransigent and are in serious financial trouble. It is unclear what

their fate will be in the future, but it is likely that one or two may fold or find another healthy society with which to partner. TAB is keeping a close watch here.

TECHNICAL COMMITTEES

By the time you receive this Newsletter, both PAC in Vancouver and the Real Time Conference in Beijing will be over. RT-2009 has five days of plenary papers, a short course, and an ATCA workshop. A record number of abstracts was submitted for the conference. This is the last odd-year Real Time Conference, so there will be a conference next year in Portugal, in either Lisbon or Madeira, with a member of the fusion community as general chair, which is a major change, but reflects the broadening of the scope of papers in real time computing. The Symposium on Fusion Engineering and ICOPS conferences will be ready to launch. For the first time ever, selected papers from SOFE will be submitted for review to TPS and those selected will be published in a special issue of the journal in April 2010. Farhat Beg, the ICOPS chair, also attended our meeting and gave us an update on the status of ICOPS and more detail about how many areas of these two conferences will be combined, including one registration fee and a shared reception and banquet, and a Women in Engineering reception. A similar arrangement will prevail in 2011 in Chicago. ICOPS had received 548 abstracts by the time of this AdCom meeting.

The Nuclear Medical and Imaging Council and Radiation Instrumentation Technical Committee have been looking hard at the rising costs of conferences. What actions will be taken is uncertain. Conferences are scheduled though 2012, and an Asian or Australian venue is likely for 2013, made possible because of the great success in Hawai'i last year. The NMIS is a technical cosponsor of the Bratislava Summer School mentioned above.

The Particle Accelerator Conference, held in Vancouver, British Columbia, will also be over by the time you receive this Newsletter. Based on the submittal of well over 2000 abstracts, this should be a successful event for all participants. Look for a report in September. The next PAC will be in 18 months, at the Marriott Marquis in New York City, but there will be an IPAC in Kyoto, Japan in 2010.

The Pulsed Power TC is looking for a replacement for Bob Reinovsky who is now NPSS Vice President/President-elect. They will be

**And if it doesn't
it's...**

**If it works, it's
obsolete.**

*Marshall
McLuhan*

What book was it?

Seldom in history has so wrong a book been so seminal in directing the future course of science.

Owen Gingerich

working on a revision of their Constitution and Bylaws. The Pulsed Power Conference, to be held in Washington, DC in late June, may be the first with a higher international attendance than North American. They show the drop in abstracts that other IEEE conferences have shown. Their 2011 conference will be in Chicago, contiguous with ICOPS/SOFE.

The next Radiation Effects conference is well discussed in the lead article. AdCom will meet in Quebec following NSREC.

The Radiation Instrumentation Committee has some new faces as well as some old ones who have been reelected. It is especially pleasing to see Barbara Obryk and Christian Bohm among the new members. As you may recall, Barbara was one of the organizers of the very successful Women in Engineering panel at the Dresden NSS/MIC, and Christian played a critical leadership role in the 2005 Real Time conference in Stockholm. Other new members are Roger Gearhart, Dick Kouzes, the NPSS's invaluable web master, and Anthony Lavietes, our assistant treasurer.

FUNCTIONAL COMMITTEES

The Conference Policy committee reported that our experiment with IEEE's Meeting Planning group is going well. They have standard contracts with many major hotel chains and can use their bargaining power to get us better rates and better contract language in general.

Under Peter Winokur the descriptions of our awards in the TAB Awards and Recognition Handbook were rewritten and brought up to date, and the monetary value of many awards was increased. Peter was also instrumental in getting the Maria Sklodowska-Curie Field Award approved. A committee is now being formed to solicit nominations and another to select the first recipient. These will be committees with representation from a number of societies.

A big issue for the Membership committee is the retention of new members. Uwe Bratzler, the chair, Peter Clout, and Beverly Banks at IEEE HQ are working on this.

We officially have 15 NPSS chapters or joint chapters but some are chapters on paper only and have little activity. Chapter support is available and chapter chairs can discuss this with Steve Gold by e-mailing him at steven.gold@nrl.navy.mil or by phone at +1 202 767 4004. Only 6 Distinguished Lectures have been scheduled for 2009. There is funding for Chapters,

Sections and Student Chapters to help bring these speakers to you.

The Nominations Committee under Jane Lehr is working on a slate to fill AdCom positions from the Radiation Effects, Radiation Instrumentation, Plasma Science and Applications, and Computer Applications in Nuclear and Plasma Sciences technical areas. Contact your technical committee chairs with suggestions.

We also had a visit from Bill Williams of IEEE-USA who spoke of their many activities in preparing white papers and other materials to educate the US Congress of key science and engineering issues, and to encourage support for R&D. His office helps coordinate the national congressional visits day and has many grassroots activities.

ADCOM ACTIONS:

- It was moved and seconded that NPSS withdraw from the Biometrics Council. This motion was tabled and John Luginsland and Jane Lehr will be temporary liaisons. See the President's Report for an update.
- It was moved, seconded and passed that NPSS technically cosponsor the Bratislava Summer School. Many of our members are involved.
- It was moved, seconded and passed to add a GOLD (Graduates of the Last Decade) Committee to our functional committees. Christoph Ilgner is the new chair and is starting to develop an action plan.
- It was moved, seconded and passed that AdCom endorses electronic AdCom elections.
- It was moved, seconded and passed that the words "pulsed intense magnetic fields" and "electromagnetic launchers" be added to the NPSS Field of Interest. The Field of Interest will be revised and submitted for TAB approval with the next review and revision of our Constitution and Bylaws, which is being started under Bob Reinovsky.
- It is moved, seconded and passed that the NPSS budget \$50k in 2010 to provide the following IEEE Meeting Planning Services:
 - On-site services for NPSS sponsored conferences that currently have an approved budget.
 - Long-range planning (site selection and contract negotiation) for NPSS sponsored conferences.

Albe Larsen, IEEE NPSS Secretary and Newsletter Editor, can be reached by E-mail at amlarsen@slac.stanford.edu.

TECHNICAL COMMITTEES

COMPUTER APPLICATIONS IN NUCLEAR AND PLASMA SCIENCE

When this newsletter is published in June, the 16th Real Time Conference (RT-2009) will already be over (May 10 to May 15). This year the conference is hosted by the Institute of High Energy Physics (IHEP) in Beijing. The general chair of the conference is Professor Yifang Wang, associate director of the institute. He is assisted by Professor Yantai Shu, from the Tianjin University, co-chair of the conference, and by Professor Zhen'An Liu, chair of the local organizing committee. This is the first time NPSS will have held a conference in China, and the response from participants has been very positive, even in the unfavourable context of the present economic situation.

A very important event during the RT conference is the presentation of the CANPS prize. This prize is given in recognition of individuals who have made outstanding contributions in the application of computers in nuclear and plasma sciences. This year, the prize is awarded to Sergio Cittolin from CERN, a very prestigious scientist in the data acquisition field. See the Awards section for further details by Patrick Le Dû concerning this award and its recipient.

Jean-Pierre Martin, chair of the Computer Applications in Nuclear and Plasma Science Technical Committee can be reached at the University of Montreal, RJA Lévesque Laboratory, Montreal (QC), Canada H3C 3J7. Phone +1 514 343 7340; E-mail: jpmartin@lps.umontreal.ca



Jean-Pierre Martin
Chair, CANPSTC

NUCLEAR MEDICAL AND IMAGING SCIENCES

At its March 7, 2009 meeting, NPSS AdCom approved a motion put forward by NMISC for Technical Co-Sponsorship of the Fifth International Summer School on Nuclear Physics Methods and Accelerators in Biology and Medicine, to be held 6–15 July 2009 in Bratislava, Slovakia. An announcement of this meeting with contact information can be found elsewhere in this newsletter.

The IEEE Technical Activities Board has given final approval to three motions initiated last year by NMISC: The values of the Edward J Hoffman Medical Imaging Scientist Award and the Young Investigator Medical Imaging Science Award have been increased to \$3000 and \$1500 respectively, and the Young Investigator Award has been officially renamed “The Bruce H. Hasegawa Young Investigator Medical Imaging Science Award.”

The 2009 NSS/MIC will be held in Orlando, Florida, in the Hilton Hotel near Downtown Disney. Richard Lanza is the General Chair, Ramsey Badawi is the MIC Program Chair and Craig Levin will be the Deputy MIC Program Chair.

In a new approach, this year's MIC will have a theme, which is “Translating Scientific Concepts into Practical Reality.” Plenary sessions during the meeting will include contributions from medical practitioners and from workers in industry, with a view to provoking discussion on how novel developments presented at the conference can be translated into devices and methods that will have a clinical impact. As in other years, there will be a range of special focus workshops and short courses, and we anticipate a very exciting program. The abstract submission deadline was May 11, 2009. Additional details can be found at <http://www.nss-mic.org/2009/>.

Knoxville, Tennessee, will host the 2010 NSS/MIC. Ron Keyser is the General Chair and David Townsend will serve as the MIC Program Chair. The meeting will be held in the spacious Knoxville Convention Center, and housing will be distributed among several downtown hotels. The organizing committee is complete, and program planning is underway.

The 2011 NSS/MIC will be in Valencia, Spain. Valencia is Spain's third largest city, beautifully situated on the eastern Mediterranean



Charles C. Watson
Chair, Nuclear Medical
and Imaging Sciences

Not all!
The suicide
terrorist is the
ultimate smart
bomb.

Bruce Hoffman

coast, with many cultural and recreational attractions. The meeting space will be in the Valencia Conference Center and the neighboring Sorollo and Hilton Hotels. David Townsend will be the General Chair.

The Disney Hotel in Anaheim, California will host the 2012 NSS/MIC meeting. Although adjacent to Disneyland, the Disney atmosphere there is subdued. Tom Lewellen will be General Chair of this meeting.

Planning for the 2013 meeting is underway. The RITC/NMISC Joint Oversight Subcommittee is currently reviewing three site location proposals: one for Beijing, China, one for Seoul, Korea, and one for Cairns, Australia. The growing interest from our Asia-Pacific community in hosting the meeting is a strong

motivating factor for holding the 2013 NSS/MIC in that region.

You can find more information on the NMIS Technical Committee and Council, including current Council membership, information on NMISTC-sponsored awards, and a copy of our constitution and bylaws, at our web site: <http://ewh.ieee.org/soc/nps/nmisc/>. Five new members are elected to NMISC each year, and we always welcome new candidates. If you are interested in standing for election, please contact me.

Charles Watson can be reached at Siemens Molecular Imaging, 810 Innovation Drive, Knoxville, TN, 37932-2562 USA; Phone: +1 865-218-2419; Fax: +1 865-218-3000; E-mail: charles.c.watson@siemens.com.

PARTICLE ACCELERATOR SCIENCE AND TECHNOLOGY NEWS



Stan Shriber
PAST Chair

Stan Shriber took over as Chair of the Particle Accelerator Science and Technology (PAST) Technical Committee (TC) from Ilan Ben-Zvi, BNL, on 2009 January 1. Stan hopes to continue the initiatives started by Ilan and interact more with the PAST membership.

Stan earned his Ph.D. in Nuclear Physics from McMaster University, Canada in 1967. From 1966 to 1984 he worked at CRNL where he was internationally recognized for linac expertise. He moved to LANL in 1984 as a senior manager including Technical Director of the SDI NPB and AOT Director (LANSCE operations and other R&D activities which led to APT and ATW). In 2001–2002, Stan spent several months at each of three European institutions. At Saclay he contributed to ESS, at CERN he contributed to the Neutrino Factory, and at FZ-Juelich he contributed to COSY and ESS. In 2003, Stan became a Michigan State University full professor, working on RIA design and teaching freshman physics courses. Now retired in Eagle, Idaho, he has ample opportunity to spend time with family and help various scientific institutions. Stan has 8 patents and more than 150 publications. He remains involved in IEEE and APS affairs, and chaired two PAC conferences (1995, 2007). Within APS-DPB he serves on the Executive Committee as the secretary-treasurer. Within IEEE-NPSS he serves as the Chair of the PAST

TC. Among much recognition, he is a Fellow of the APS and a Fellow of IEEE.

ORGANIZATION:

The PAST TC has been organized with the following responsibilities. As the past PAST Chair, Ilan Ben-Zvi (BNL) will be in charge of the Fellows and Awards subcommittee; responsible for nominating our PAST award candidates and fellows. As the former past PAST Chair, Bruce Brown (FNAL) will be in charge of our Web and Communications subcommittee; responsible in part for our PAST TC web site. Our elected PAST TC member for IEEE-NPSS AdCom, Sandra Biedron (ANL), is chair of our Nominating, Education and Outreach (includes our interests in Women in Science and Engineering) subcommittee; responsible in part for nominating members who could be elected to serve on the IEEE-NPSS AdCom. And finally, Paul Schmor (TRIUMF) is chair of our Conferences subcommittee.

CONFERENCES:

Activities continue in high gear for the 2009 Particle Accelerator Conference (PAC'09) being held in Vancouver, BC 2009 May 4 to 8. PAC'09 is jointly sponsored by IEEE-NPSS and APS-DPB, and is hosted by TRIUMF, Canada's Particle and Nuclear Physics National Laboratory. Details for PAC'09 can be found at

their web site: <http://www.triumf.info/hosted/PAC09/>. Everything is moving smoothly and the key conference organizers are busy with last minute preparations: Conference Chair Paul Schmor, Scientific Program Committee Chair Shane Koscielniak, Conference Treasurer Shirley Reeve and Local Organizing Committee Chair Yuri Bylinski. Expectations are that this conference will be a huge success with more than 1500 attendees worldwide and more than 1500 scientific/technical contributions.

Planning is underway for the next conference in the PAC series, PAC'11, which will be held at the New York Marriott Marquis in downtown New York, NY, 2011 March 28 – April 1. This conference will be the first PAC conference in North America being held between the three-year cycle IPAC conferences: the first, IPAC'10, being held in Kyoto, Japan 2010 May 24–28 and the second, IPAC'11, being held in Spain 2011 September. The chair of our PAC'11 conference is Thomas Roser, BNL, who is busy putting his conference team and budget together.

Planning is also underway for the first IPAC conference, IPAC'12, to be held in North America, the third in this new series and for us the 25th in the series of PAC conferences in North America. It will be held in New Orleans, LA, 2012 May 20–26 at the New Orleans Convention Center with Vic Suller, LSU, the conference chair. Vic is also busy putting his conference team and budget together.

Search subcommittees have been initiated for PAC'13 which will be held on the West Coast in the Fall of 2013 (Steve Gourlay, LBNL chairs this search subcommittee) and for IPAC'15 which will be held on the East Coast in the Spring of 2015 (Derek Lowenstein, BNL chairs this subcommittee).

AWARDS:

PAST awards presented at the PAC'09 conference in Vancouver, BC are listed below:

2009 Particle Accelerator Science and Technology Award

Professor Chandrashekhar Joshi, UCLA, “For his pioneering role, scientific contributions and leadership in the development of laser and particle driven plasma accelerators.”

2009 Particle Accelerator Science and Technology Award-Early Career

Dr. Kiyomi Seiya, FNAL, “For developing and successfully implementing ‘slip stacking’ of proton batches injected into the Fermilab Main Injector resulting in a significant increase beam intensity.”

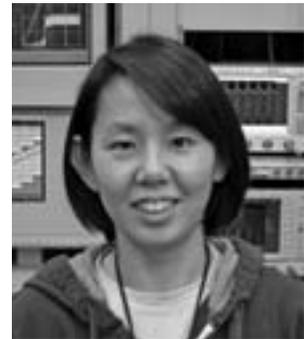
2009 Particle Accelerator Science and Technology Award - Doctoral Student Award

Dr. Efthymios Kallos, Queen Mary University of London (University of Southern California for thesis), “For the demonstration of two-bunch high-gradient acceleration in a plasma wakefield accelerator and the development of novel multi-bunch concepts.”

Stan Schriber can be reached at his home in Eagle, ID 83616 USA; Phone: +1-208-631-8208, E-mail: schriber@nsl.msu.edu



Chandrashekhar Joshi



Kiyomi Seiya

NPSS PULSED POWER SCIENCE AND TECHNOLOGY

Final preparations are underway for the 17th IEEE International Pulsed Power Conference, which will be held June 29 to July 2, 2009 at the Renaissance Mayflower Hotel in Washington, DC. Dr. Frank Peterkin of the Naval Surface Warfare Center, Dahlgren VA, is the Chair of the conference and Dr. Randy Curry of the University of Missouri is the Technical Program Chair. The technical program, registration information, and lodging information can be found on the conference website: <http://www.ece.missouri.edu/ppc2009>. The organizers have assembled an exciting technical program of plenary talks, invited talks, oral presentations, poster presentations, and industrial



exhibits. The Tuesday morning plenary session will have Dr. Chris Deeney (DOE) give a presentation entitled *Coulombs to Pascals - Pulsed Power for High Energy Density Science*. Other plenaries will include addresses by Tom Naff (Erwin Marx Award recipient) and John Maenchen (Peter Haas Award recipient). An outstanding social program and a full companions' program have also been arranged (details can be found at: <http://ppc.missouri.edu/events.html>). Whether you will be coming from across the city or from around the world, we look forward to seeing you at our Nation's Capital during this festive week!

Planning for the 18th IEEE International Pulsed Power Conference, to be hosted by the



Edl Schamiloglu
Chair, PPST

And the next winner is... King Edward's [VII] new policy of peace was very successful and culminated in the Great War to End War.

W.C. Sellar and R.J. Yeatman

University of Missouri at Columbia, is well underway. Dr. Randy Curry is the Chair of the conference, which will be held at the McCormick Place Hyatt Regency in downtown Chicago, IL from June 19–23, 2011. This conference will be followed by the 38th IEEE International Conference on Plasma Science, which will be held June 26–30 in the same venue, combined with the IEEE NPSS Symposium on Fusion Engineering.

We are pleased to announce that the 19th IEEE International Pulsed Power Conference will be combined with the 40th IEEE International Conference on Plasma Science as PPPS-2013. The conference chair will be Dr. Bryan Oliver of Sandia National Laboratories and Pat Corcoran of L3 Communications/Pulsed Sciences Div. will be the local arrangements chair. PPPS-2013 will be held in downtown San Francisco and the site selection committee expects to finalize the venue and the dates by Summer 2009.

Looking ahead to 2015, Dr. Mark Crawford of the Institute for Advanced Technology at The University of Texas at Austin has

expressed an interest in possibly hosting the 20th IEEE International Pulsed Power Conference in Austin.

The 15th Electromagnetic Launch Symposium is technically co-sponsored by IEEE NPSS and will be held May 17–20, 2010 at The Royal Military Academy in Brussels, Belgium. Select papers presented at this conference will be published as a Special Issue of the *IEEE Transactions on Plasma Science* in 2011.

Finally, as you may have noticed, the *IEEE Transactions on Plasma Science* (Dr. Steven J. Gitomer, Editor-in-Chief) is now a monthly publication. I am the Senior Editor for Pulsed Power Science and Technology and I encourage you to submit your technical articles in this discipline to the *Transactions*.

Edl Schamiloglu, Chair of the Pulsed Power Science and Technology Technical Committee, can be reached at the Department of Electrical and Computer Engineering, University of New Mexico, MSC01 1100, Albuquerque, NM 87131-0001; Phone: +1 505 277 4423; E-mail: edl@ece.unm.edu.

FUNCTIONAL COMMITTEES

COMMUNICATIONS COMMITTEE



Peter Clout
Communications
Committee, Chair

It is so important to not only run excellent professional meetings, short courses and publish excellent publications and newsletters like this, but also tell everyone about them! Publicity ensures that the most benefit is derived from all the opportunities that we create.

Now, more than ever, we need not only good technology as a society, but excellent and timely information as professionals to remain vital and effective in our jobs.

It has been the job of the communications committee to provide some of the tools to help all the NPSS volunteers to better serve their communities. The materials for the coming two years are, at the time of writing, at the printers. This year the brochure has been updated and new leaflets have been designed and printed. In addition, we have printed new posters, both of the size to go on a notice board and also one twice the size to get more attention where the space is available. Please pick one up at a conference or ask me to send you one or two if you have somewhere to put them up.

The images of the posters are on the web site so that you can, if you wish, download them and print them locally.

For conferences we have a booth to ship to the meeting consisting of banners to go behind the information and recruiting table but as these are relatively heavy, they are expensive to ship outside North America and customs issues have to be addressed to avoid duty and taxes on items only temporarily imported for use at the conference. To address this, we had similar equipment bought in Europe for use there and the EEC ensures that customs issues will be minimal.

With more and more conferences in Asian countries (one each in China and Japan this year) another solution had to be found as the European solution would not solve the customs issues there as there is no Asian equivalent of the EEC. We have had the banner images printed on good-quality paper so that they can be shipped and hung on the wall behind the information and recruiting table or some other place close by with no need for them to be returned.

If you can use brochures, leaflets, posters or other informational material at your meetings, place of work or other events, please contact me in time for us to ship what you need to you.

Peter Clout, chair of the Communications Committee, Vista Control Systems, Inc., 2101 Trinity Sq., Suite Q, Los Alamos, NM 87544-4103; Phone: +1 505-662-2484; Fax: 505-662-3956; E-mail: clout@vista-control.com.



Over 4000 pounds of literature for NPSS Activities



Christoph Ilgner
*Chair,
GOLD Committee*



Steve Gold
*Distinguished
Lecturers Program*

THE NUCLEAR AND PLASMA SCIENCES SOCIETY STARTS GOLD ACTIVITIES

GOLD—Graduates of the Last Decade—are very special members of IEEE—their first professional degree is less than ten years old. With respect to this, many of them may not even be aware of the fact that they are so special. However, these members are important to our society, and the society is important for them. Graduates of the last decade are in an important transition period of their professional life. Many of them will have found their first employer or have started their own business—successfully, internationally, full of enthusiasm. We should profit from this enthusiasm.

Others may have encountered difficulties of various kinds. Life is never straightforward in any sense, including in its professional aspects. If all goes well, this is interesting, challenging, it can open up an enormous potential. IEEE is there to help, and if we do, we will in return profit from lots of new ideas and enthusiasm present in our young colleagues.

That is why the Nuclear and Plasma Sciences Society has decided to start special GOLD activities, setting up a GOLD committee, and I am glad that I can serve as the chair of this committee. Since I have graduated in 1996 from Technische Universität München, Germany, my GOLD status has expired only recently, so the memory of my first professional steps is still quite fresh. Jane Lehr, our past president, and Uwe Bratzler have already volunteered to

help on the committee, making it an international one, thereby also covering several fields in which our society is active.

We have already started to work on some program items for NPSS-GOLD members: For instance, we propose to hold special GOLD receptions at our conferences. Ideally, we will offer such a reception at a large NPSS conference starting this year. IEEE Fellows of our society will also be invited, so GOLD members can make contact in an informal atmosphere both with each other and with some of the most senior, influential members. We are open to further suggestions of any kind, with the primary goal being to help our young professionals.

And, if you are a GOLD member reading this article, I would be particularly glad to hear from you. Just sit down for a minute or two, write me a short e-mail, sharing your ideas about what a recent graduate expects from the Nuclear and Plasma Sciences Society. There is virtually no threshold to get involved, and it opens up the possibility to become active in a variety of ways in our society. These activities not only can, they will foster your professional development!

Looking forward to hearing from you,

Christoph Ilgner, NPSS GOLD committee chair, can be reached at the Technische Universität Dortmund, Experimentelle Physik 5, 44221 Dortmund, Germany; Phone: +41-22-76-72969; E-mail: Christoph.Ilgner@cern.ch

DISTINGUISHED LECTURER PROGRAM

Are you in charge of planning a program for a chapter or section meeting? For 2009, the IEEE/NPSS Distinguished Lecturers Program is making available 36 different lectures by 20 distinguished members of its technical community. These lectures can be provided at no cost to NPSS Chapter, IEEE Section, and IEEE Student Chapter meetings, and are also available to other IEEE groups, as well as to out-

side organizations such as universities. The lecture titles and abstracts, as well as biographical information on each lecturer, can be found on the NPSS Distinguished Lecturers website, http://ewh.ieee.org/soc/nps/NPSS_DLP.html.

For additional information, please contact Steven Gold, NPSS Chapters and Local Activities Chair and Distinguished Lecturers Coordinator, at steven.gold@nrl.navy.mil.

2009 Distinguished Lecturers Program		
Fusion Technology	Prof. Farrokh Najmabadi (UCSD) "Characteristics of an Economically Attractive Fusion Power Plant" fnajmabadi@ucsd.edu	Brad Nelson (ORNL) "Engineering Challenges for ITER" nelsonbe@ornl.gov
Nuclear Medical and Imaging Sciences	William W. Moses (BNL) (1) "Fundamentals of Nuclear Medical Imaging"; (2) "Time-of-Flight PET"; (3) "Advances in Scintillators for Medical Imaging Applications"; (4) "Scintillator Non-Proportionality: Present Understanding and Future Challenges"; (5) "Selected Topics in Nuclear Medical Imaging and Radiation Detection" WWWMoses@lbl.gov	David W. Townsend (National University, Singapore) (1) "The evolution of hybrid imaging"; (2) "Lost in Translation - From Basic Science to Clinical Reality" DTownsend@mc.utmc.edu
Particle Accelerator Science and Technology	Dr. Baruch Levush (NRL) "Vacuum Electronics Technology" baruch.levush@nrl.navy.mil	Patric Muggli (USC) (1) "Miniaturization of particle accelerators using plasmas"; (2) "Plasma-based radiation sources"; (3) "Ultra-fast beam diagnostics" muggli@usc.edu
Plasma Science and Applications	J. Pace VanDevender (SNL) "Ball Lightning--New Physics, New Energy Source, or Just Good Entertainment" jpvande@sandia.gov	Igor Alexeff, UTK (ret) (1) "The Plasma Antenna - Now you see it, now you don't."; (2) "The Plasma Sterilizer - Killing bacteria with a ceramic floor tile."; (3) "Ball Lightning - Balls of fire in the laboratory."; (4) "Thermonuclear fusion power plants - the ultimate energy source - maybe." alexeff@utk.edu
Pulsed Power Science and Technology	Dr. Giovanni Lapenta (Katholieke Universiteit Leuven, Belgium) (1) "The Particle In Cell (PIC) method as a general tool for plasma simulation and beyond"; (2) "The challenge of multiple scales in space weather and fusion plasmas" giovanni.lapenta@wis.kuleuven.be	Dr. Peter J. Turchi (LANL) "Plasma and Mega-gauss Fields" turchi@lanl.gov
Radiation Effects	Dr. Charles H. Stallings (Stallings & Associates) "Pulsed Power - What Is It and Why Should You Care?" estallings1@comcast.net	Dr. Allan Johnston (JPL) (1) "Radiation Effects in Optoelectronic Devices"; (2) "An Introduction to Space Radiation Effects in Electronics" Allan.H.Johnston@jpl.nasa.gov
Radiation Instrumentation	Dr. John D. Cressler (Georgia Tech) "Radiation Effects in Silicon-Based Heterostructure Device Technologies" john.cressler@ece.gatech.edu	Dr. Paul Lecoq (CERN) (1) "Development of new scintillating crystals for High Energy Physics, Medical Imaging and other applications"; (2) "Spin-off from particle detectors in the field of medicine and biology"; (3) "Metamaterials for novel X or gamma ray detector designs"; (4) "Molecular Imaging Challenges with PET and SPECT techniques" Paul.Lecoq@cern.ch
Transnational Committee	Dr. Alessandro Rizzo (Politecnico di Bari, Italy) "Soft Sensors and Artificial Intelligence: exploiting experimental data and human expertise to design effective tools for modelling, monitoring, validation and control" rizzo@decmail.poliba.it	Thomas Roser (BNL) "Accelerating and colliding relativistic heavy ions" rosert@bnl.gov Mounir Laroussi (Old Dominion Univ.) "Interaction of Cold Plasmas with Biological Cells: Can Plasmas Play a Role in Modern Medicine?" mlarouss@odu.edu Bryan Oliver (Sandia) "Intense electron beam diodes for X-ray generation" bvolve@sandia.gov

IEEE FELLOW NOMINATIONS

Are due by March 1, 2010

Encourage you to nominate a deserving colleague for IEEE Fellow and begin the job of preparing the application and lining up references now. It's not too early. Each year, deserving nominations just make the deadline, while others fall short by only a few days. Nominating forms, detailed instructions, and frequently asked questions can be found at the IEEE Fellow Program Web Site at www.ieee.org/fellows.

To be nominated, the nominee must meet the following three basic qualifications: hold IEEE Life Senior Member or IEEE Senior Member grade at the time the nomination is submitted; be a member in good standing (that is, dues must be current); and must have completed five years of service in any grade of IEEE membership. Note and this is very important—IEEE affiliate membership within an IEEE society does not apply. I'm often shocked to learn that folks who have made significant contributions to our Society aren't even Senior Members. It only takes a few minutes to prepare an application to be a Senior Member and it is web based.

A nomination must be supported by at least five, but no more than eight references from active IEEE Fellows or IEEE Life Fellows. For nominees who reside in Region 9, references will also be accepted from IEEE Life Senior Member or IEEE Senior Members. The biggest stumbling point for nominations is getting five references. If possible, nominators should list eight references. That way, if one or two references can't meet the deadline, the nomination still has the required five references. A list of IEEE Fellows can be found at the IEEE Fellow Program Web Site. NPSS has elevated many fellows over the years, so it shouldn't be difficult to identify a strong list of references. I suggest that nominators contact the Chairs of NPSS's Technical Committees for assistance. They can be found on the NPSS website at http://www.ewh.ieee.org/soc/nps/adcom_officers.html.

The Fellow process at IEEE is now fully electronic. For the last five years, The Electronic Fellow Nomination Process (EFNP) has been available to nominators, references, and endorsers. In 2009, the IEEE NPSS Fellow Evaluation Committee (FEC) will receive all nominations referred to NPSS in electronic format. The NPSS FEC will review, score, and rank these

nominations online. This will clearly expedite the committee's work. The NPSS FEC expects access to nominations by April 15 and must provide its feedback to IEEE by June 15.

The IEEE Board of Directors recently approved changes to the process for nominating and elevating 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." In the last two years, NPSS has successfully elevated several members in this category.

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.

This year the NPSS FEC added three members from the international community. They are Professor Paul Chu from the City University of Hong Kong, Erik Heijne from CERN in Switzerland, and Jean-Luc Leray from CEA in France. Welcome aboard! They join U.S. members Ron Huesman, Stan Schriber, Jim Schwank, and Peter Turchi. We regret that Professor Osamu Ishihara will be leaving the committee. We are grateful for his many years of outstanding service as both the Chairman and member of the NPSS FEC.

On behalf of the NPSS Fellows Evaluation Committee, I urge you to consider making an IEEE Fellow nomination next year. March 1, 2010 will be here sooner than you think. Being elevated to an IEEE Fellow is a very special and noteworthy milestone in anyone's career. Last year, 6 members of NPSS were elevated to Fellow grade. They were Ilan Ben-Zvi, Dennis Brown, Gerald Cooperstein, Lars Eriksson,



Peter Winokur
Chair, Fellow
Evaluation Committee

Applies to more than the power grid
There's a conflict between protection of an asset and protection of a system.

Douglas A. Voda

Guess who
He achieves
certainty by
arresting
thought.

Jack Beatty

Ravindra Joshi, and Mounir Laroussi. Our sincere congratulations!

As always, this is an extremely competitive process—only 0.1% of the total voting IEEE membership can be elevated to the grade of Fellow each year. It's always challenging to review these nominations. I hope you can make our

job even more difficult by increasing the number of nominations in 2010.

Peter S. Winokur, Chair, NPSS Fellow Evaluation Committee, can be reached at the Defense Nuclear Facilities Safety Board, Washington, DC; Phone: +1 202 694-7090; E-mail: p.winokur@ieee.org.

CHAPTER NEWS

ITALIAN CHAPTER SPONSORS PHYSICS AND CONTROLS CONFERENCE



Alessandro Rizzo

The NPSS Italy Chapter is technically co-sponsoring the “4th International Conference on Physics and Control,” that will be held in Catania, Italy, at the Engineering Faculty, 1-4 September 2009. The Conference will focus on the interdisciplinary research activities at the borderline between Physics and Control and is promoted by the International Physics and Control Society (IPACS), uniting experts in such areas as non-linear dynamics and control; nuclear fusion technology; control of plasma, beams, lasers; quantum information and control; control of oscillations, chaos and bifurcations; control in thermodynamics; modeling and identification of physical systems; complexity and self-organization; analysis and control of complex networks; network and system synchronization; mechanical systems and nanotechnologies; as well as other related applications in science and technology. The Conference is further promoted and supported by other International Organizations such as the Centre for Chaos

and Complex Networks at City University of Hong Kong, STMicroelectronics Catania, Scuola Superiore di Catania, and INFN Catania (National Institute for Nuclear Physics).

The Conference scope will cover a broad interest area in different disciplines and involve leading scientists from many different fields. The focus will be given to those activities at the edge of Physics and Control with emphasis on both theory and applications.

A Distinguished Lecture will be given by Dr. Alessandro Rizzo from Politecnico di Bari on “Soft Sensors and Artificial Intelligence: exploiting experimental data and human expertise to design effective tools for modeling, monitoring, validation and control in fusion technology”.

Two mini-symposia will be held on “Modelling and Optimization of Beam and Plasma Dynamics” and “Physics and Control in Fusion Plasma Devices.”

For further information visit www.physcon2009.dies.unict.it.

SARATOV CHAPTER

The Saratov/Penza AP/ED/MTT/CPMT/NPS Joint Chapter in the Central Russia IEEE Section was founded in 1995 and became affiliated with the Nuclear and Plasma Sciences Society in October 2008. Its membership normally ranges from 30 to 40, and includes members from both academia and industry. Most of the members represent Saratov

State University (SSU), Saratov State Technical University (SSTU), the Saratov Branch of the Institute of Radio Engineering and Electronics (SB IRE) of the Russian Academy of Science (RAS), and the Federal State Enterprise “Almaz.” Many of the members work in the fields of high power vacuum microwave tubes, pulsed power technique, particle beams and accelerators.

The main activity of the Chapter is the technical and financial cosponsorship of many conferences that are held in Saratov. Among them are the Saratov Winter School–Seminar on Microwave Electronics and Radio Physics, the International Conference on Chaotic Oscillations and Pattern Formation (CHAOS), and the International Conference on Actual Problems of Electronic Devices Engineering (APEDE). The Chapter also supports two annual conferences for young scientists, including both graduate and undergraduate students: “Nonlinear Days in Saratov,” organized by the SSU, and “Nanoelectronics, Nanophotonics and Nonlinear Physics,” organized by the SB IRE.

In addition to these conferences, the Chapter holds the annual Workshop “Electromagnetics of Microwaves, Submillimeter and Optical Waves” at which 10 technical papers are typically presented. Since 2003, this Workshop has been part of the International School on Optics, Laser Physics, and Biophysics “Saratov Fall Meeting,” which is organized in collaboration with the Saratov SPIE Chapter. The Chapter publishes selected papers presented at the Workshop in “Modeling in Applied Electrodynamics and Electronics.” Eight issues have been published since 1998.

The most recent major event supported by the Chapter was the XIV Saratov Winter School–Seminar in Microwave Electronics and Radio Physics, which was held in Saratov on February 3–8, 2009. These schools have been held every third year since 1970, and provide a unique opportunity for presentations and discussion of broad topics related to vacuum microwave electronics. The XIV School was organized by the SSU and the SB IRE, with financial cosponsorship by the Russian Foundation for Basic Research and the “Dynasty” Foundation. Members of the Saratov/Penza Chapter played an active role in organizing the

School. Prof. D. I. Trubetskov served as the Conference Chairman, and Prof. Yu. I. Levin, Prof. Yu. P. Sharaevsky and Prof. N.M. Ryskin were the key members of the Local Organizing Committee responsible for the technical and social program.

The technical program of the School included 27 invited plenary lectures reviewing topical problems of theory, simulation and technology of vacuum tubes, high-power microwaves, vacuum microelectronics, microwave electrodynamics, and nonlinear science and its application to microwave electronics. Also, the program included 20 oral and 36 poster presentations. The total number of participants was nearly 100, representing many regions of Russia as well as guests from Belarus, Ukraine, and the USA. The plenary lectures included:

- “Vlasov’s kinetic theory of plasma” by P.A. Polyakov, Moscow State University
- “Development of field emitters from carbon-containing materials” by G.G. Sominsky, St.-Petersburg Polytechnic University
- “Quasi-optical control of intense beams of microwave radiation” by M.I. Petelin, Institute of Applied Physics, Nizhny Novgorod
- “Terahertz band gyrodevices” by V.L. Bratman, Institute of Applied Physics, Nizhny Novgorod
- “Non-stationary discrete modeling of coupled-cavity traveling wave tubes” by N.M. Ryskin, Saratov State University

Special issues of the Russian journals *Applied Nonlinear Dynamics* and *Radiophysics and Quantum Electronics* that include selected papers presented at the conference will be published in 2009.

More information about the Saratov/Penza Chapter structure and activities can be found on the Chapter web page <http://www.sgu.ru/faculties/physical/IEEE/>.

Voice of experience
To assume that more or less democratic governments have tended to behave with integrity in the funding, administration and application of science is naive...

John Cornwell

AWARDS



Bill Moses
Awards Chair

The NPSS gives awards in three different categories each year—Conference (where only attendees at that conference are eligible), Technical Committee (where only members of that Technical Committee are eligible), and Society (where all NPSS members are eligible). As Chairman of the NPSS Awards Committee, I'm pleased to announce this year's recipients of the Society Awards. The recipient of the Merit Award, which is for scientific and technical achievement, is Dan Fleetwood of Vanderbilt University, for contributions to the understanding of radiation effects in microelectronic devices and materials. The recipient of the Early Achievement Award which is also for scientific and technical achievement is Jinyi Qi of the University of California at Davis, for contributions to computational nuclear medical imaging science, particularly statistically based three-dimensional image reconstruction. The recipient of the Richard F. Shea Award, which is for service to the NPSS, is Peter Winokur of the Defense Nuclear Facilities Safety Board.

The four recipients of the Graduate Scholarship Award are David French of the University of Michigan, Antonius Indarto of Università di Torino, Sarita Prasad of the University of New Mexico, and Jacob Zier of the University of Michigan. A description of each awardee is given below.

More information on these and other relevant Awards, including submission information for next year, is available at <http://ewh.ieee.org/soc/nps/awards.htm>.

In addition, there are many Institute awards, and we are very proud that the recipient of the 2009 Emberson Award is our own Harold Flescher. Descriptions and nomination information for Institute awards can be found at: http://www.ieee.org/web/membership/students/scholarshipsawardscontests/SAG_homepage.html

Bill Moses, Chair of the NPSS Awards Committee, can be reached at Mailstop 55-121, 1 Cyclotron Road, Berkeley, CA 94720; Phone: +1 510-486-4432; Fax: 510-486-4768; E-mail: wwmoses@lbl.gov.

IEEE AWARD

Harold Flescher to Receive 2009 Emberson Award



Harold Flescher
2009 Emberson
Recipient

Harold L. Flescher, Past President of the NPSS ('91-92) and former Division IV Director, is the winner of the prestigious Richard M. Emberson Award for 2009. The nomination form selection criterion reads as follows:

The IEEE Richard M. Emberson Award shall be awarded to recognize distinguished service to the development, viability, advancement, and pursuit of the technical objectives of the IEEE.

Harold Flescher was recognized not just for long and distinguished service as a volunteer for IEEE, but also specifically for his contributions as a member, Treasurer and Chair of the Technical Activities Board (TAB) Finance Committee during the turbulent collapse of the stock market at the end of the 1990's. His nomination by distinguished peers cited the major role that Harold played in analyzing IEEE's financial systems, identifying structural flaws and leading a drive toward correction and establishment of a more transparent, accountable and sustainable business model. The solutions required sacrifice by every Society member of TAB and getting approval was a severe challenge, but Harold's efforts were successful and have endured. This unique con-

tribution to IEEE was recognized by the Awards Committee which settled on the citation:

"For contributions to understanding and reorganizing the financial structure of TAB and the IEEE to better serve IEEE members and the broader technical community."

Awards Committee members remark that awards like the Emberson are always difficult to adjudge because every candidate brought forward has a long, full career of dedicated IEEE service. Many of the candidates are distinguished academics, researchers, educators, holders of high office in IEEE and public figures. Harold is an Engineering Manager whose main professional activities have been in the Radiation Effects community of IEEE NPSS and in the Defense R&D industry, areas that do not always get the high visibility they would enjoy in more open fields. However Harold's sound management skills and hard-headed business sense have taken him to the highest ranks in IEEE as a Society President and Division Director of IEEE, and he continues to serve in TAB management and financial areas.

Prepared by Ray Larsen who can be reached by E-mail at Larsen@slac.stanford.edu.

SOCIETY AWARDS

Peter S. Winokur IEEE NPSS Richard F. Shea Award

Peter S. Winokur has been awarded the Richard F. Shea Distinguished Member Award.

Peter received his B.S. degree in Physics from the Cooper Union in 1968 and his M.S. and Ph.D. degrees in Physics from the University of Maryland, in 1971 and 1974, respectively. Peter was appointed in 2006 to serve as a Member of the Defense Nuclear Facilities Safety Board (DNFSB). The Defense Nuclear Facilities Safety Board is an independent federal agency established by Congress in 1988 whose mandate is to provide safety oversight of the nuclear weapons complex operated by the Department of Energy (DOE). Before that, he was a Senior Policy Analyst at the National Nuclear Security Administration in Washington, D.C, and also served as an IEEE Congressional Fellow in the Office of Senator Harry Reid, Washington, DC. Peter was a recognized leader among congressional staff on renewable-energy tax incentives, and contributed significantly to the national debate on energy issues including electricity, fuels, climate change, oil and gas, coal, etc. Peter also supported a full range of transportation issues including highways, airlines, high-speed rail, marine, and the reauthorization of the Transportation Equity Act, as well as Defense Appropriations.

Peter worked at Sandia National Laboratories, Albuquerque, New Mexico from 1983–2000 in a variety of positions, the last of which was Manager, Radiation Technology and Assurance Department. Peter was responsible for Sandia's research and development programs in radiation effects science, technology, and quality assurance for space and military applications. Peter established procedures for safe operation of radiation facilities as part of DOE's Integrated Safety Management System. He supervised the modification of facili-

ties to allow for safe egress by the public and workers during accident scenarios. Peter's department interacted strongly with academia, industry, and government customers that included DTRA, DARPA, JPL, NSA, and SEMATECH. Technical activity areas included radiation physics to identify physical mechanisms governing microelectronics device response to ionizing radiation and high-energy cosmic rays; hardness assurance to define new test tools, techniques, procedures, and guidelines to ensure device operation in hostile radiation environments; development of radiation-hardened deep-submicron Si technologies; and teraflop-scale modeling and simulation of semiconductors. Peter developed techniques to separate oxide and interface trap charge effects, and used this to optimize and control the performance and reliability of a 10-Mrad(Si) hardened Si-gate CMOS process for VLSI application. Peter began his career at Harry Diamond Laboratories in 1969; there he discovered the two-stage mechanism of interface-trap buildup, and performed original research on radiation effects on electronics.

Peter has been active in a wide variety of leadership roles in the IEEE NPSS. He has served as President of NPSS, as Chairman of the Radiation Effects technical committee, and is currently chair of the IEEE NPSS Fellow Evaluation Committee. He has been a guest editor of the December IEEE Transactions on Nuclear Science, and served as Technical Chair of the IEEE Nuclear and Space Radiation Effects Conference. Peter also received the 2005 Nuclear and Plasma Sciences Society Merit Award.

Citation: *For outstanding contributions to the leadership of the IEEE Nuclear and Plasma Sciences Society and the IEEE NPSS Radiation Effects Committee.*



Peter S. Winokur

Social distance
Stand not too
near the rich
man lest he
destroy thee -
and not too far
away lest he
forget thee.

Ecclesiasticus

Daniel M. Fleetwood

IEEE NPSS MERIT AWARD



Daniel M. Fleetwood

Dan Fleetwood is a leader in understanding the effects of radiation on semiconductor materials and devices. He has done pioneering work on almost every aspect of MOS radiation response, including identification of physical mechanisms, characterization methods, and applications to device-level analysis. His work on thermally stimulated current (TSC) provided depth and rigor to the analysis of radiation-induced-hole trapping in MOS devices, and provided information on hole and electron trapping in SiO₂. Dan also identified the physical properties of border traps and is the originator of the term “border trap.” He developed TSC, noise, and C-V methods to estimate border-trap densities.

Dan has made fundamental contributions to test methods for integrated circuits. He and his collaborators at Sandia and elsewhere in the radiation effects community performed basic research that unified models of the complex time and dose rate dependencies of MOS defect growth and annealing, which provide the technical basis for the present standards for total dose radiation testing in the US (MIL-STD 883, Test Method 1019) and Europe (ESA/SCC BS 22900). Dan developed irradiation and high-temperature anneal sequences that ensure MOS devices that pass short-term radiation tests on the ground will not fail at long times in space. Moreover, he helped lead government and industry standards development processes to ensure the test methods were accurate and easy to use. These methods were the first standards to specifically address the difficult issue of predicting MOS total dose response in space, and now govern acceptance of electronics for all military and space radiation environments.

Dan demonstrated the link between pre-irradiation noise and the amount of

radiation-induced hole trapping in MOS gate oxides. This led to the identification of the oxygen vacancy as the dominant defect responsible for the noise, and showed the utility of low-frequency noise as a method to help understand and predict MOS radiation response. This work resolved the longstanding problem of the origin of 1/f noise in MOS devices. He also showed that, if devices are processed with reduced O vacancy densities (e.g., by reducing post-oxidation temperatures, and reducing hydrogen in processing), they show noise approaching the low levels of JFETs. These techniques were applied to develop lower noise analog electronics for accelerator applications.

Dan originated the use of elevated temperature irradiation to help predict the low-dose-rate response of irradiated bipolar devices and made key contributions to understanding the physical processes responsible for the low-dose-rate enhancement. Also, Dan and his team members performed key experiments that identified the conditions under which hydrogen reacts at Si/SiO₂ interfaces and explained the results based on first-principles quantum-mechanical calculations.

Dan is a Professor of Electrical Engineering and Chairman of the Electrical Engineering and Computer Science (EECS) Department at Vanderbilt University, where he previously served as Associate Dean for Research of the School of Engineering. Prior to arriving at Vanderbilt in 1999, he was a distinguished member of the technical staff at Sandia National Laboratories. In 2000, Dan was named one of the original “250 most highly cited authors” in the field of engineering by the Institute for Scientific Information.

Prepared by Ron Schrimpf, who can be reached at ron.schrimpf@vanderbilt.edu.



Jinyi Qi

Jinyi Qi

IEEE NPSS Early Achievement Award

Jinyi Qi has rapidly established himself as one of the leading research scientists in the field of computational imaging. He is particularly well known for his work to develop *maximum a posteriori* (MAP) 3D reconstruc-

tion algorithms for positron emission tomography (PET) that build on a Bayesian framework with accurate modeling of the imaging system and deliver stunning and quantitatively accurate images.

Qi obtained his B.Eng. degree in Electrical Engineering from the prestigious Tsinghua University in Beijing. His early research in the field was conducted at the University of Southern California (USC) where he was a graduate student under the direction of Dr. Richard Leahy, obtaining a M.S. in 1997 and subsequently his Ph.D. in Electrical Engineering in 1998. Jinyi moved to the Lawrence Berkeley National Laboratory (LBNL) as a Scientist and then on to the University of California at Davis where he currently holds the title of Associate Professor, and Vice-Chair in the Department of Biomedical Engineering.

Qi's thesis research at USC involved the development of fast fully 3D nonlinear Bayesian reconstruction methods for 3-D PET. Through clever use of symmetries and multithreading techniques he was able to reduce computation times for these problems by orders of magnitude. Furthermore, through incorporating more accurate models of the detection process, he was able to significantly improve resolution in small animal imaging scanners relative to any of the other reconstruction methods in use at that time. Software that implements this approach, much of which was written by Jinyi, is now licensed to and distributed by Siemens and in routine use in small animal imaging laboratories throughout the world. More recently he has continued to develop efficient methods for iterative image reconstruction for application specific breast and prostate imaging systems at LBNL and a combined MRI/PET system at UC Davis.

Coupled with his work on image reconstruction Jinyi has also addressed the related

problem of assessing the performance of nonlinear Bayesian image estimators. It is in this area that Jinyi has really made his mark as an independent researcher. Building on related work by Jeff Fessler of the University of Michigan, he developed approximate analytic formulae that can be used to rapidly compute the resolution and variance of Bayesian estimators. His early results included expressions for variance and covariance in 2D and 3D that account for the spatially variant response of the scanner and the effects of missing data in 3D. Since then Jinyi has extended these ideas to develop closed form expressions for the detectability of lesions, under a range of different conditions and with different priors, that have importance in task-based selection of image reconstruction parameters and system optimization for the design of new PET scanners.

Qi has published more than 50 peer-reviewed journal articles, with the majority of his work published in IEEE journals. His articles have already been cited over 1,000 times, and his papers have an average of more than 20 citations each, which is evidence of the influence they have had on the field. Qi also is a major contributor to the profession at large. He is an Associate Editor for *IEEE Transactions on Medical Imaging*, and a frequent reviewer for IEEE journals as well as other leading journals in the field, and has served on many NIH study sections.

Jinyi Qi can be reached at Department of Biomedical Engineering, University of California Davis, One Shields Avenue, Davis, CA 95616. (530) 754-6142. qi@ucdavis.edu.

We're getting there quickly
Technological progress has merely provided us with more efficient means for going backwards.

Aldous Huxley

David M. French

IEEE NPSS Student Scholarship Awards

David French is a third year graduate student in the Department of Nuclear Engineering and Radiological Sciences at the University of Michigan, Ann Arbor. His Ph.D. thesis is devoted to the studies of nonlinear transmission lines and high power microwaves, on a National Defense Science and Engineering Graduate Fellowship. It is under the joint supervision of Professors Y. Y. Lau and Ronald M. Gilgenbach, in close collaboration with scientists at the Air Force Research Laboratory, Kirtland AFB, where he is a regular summer intern on the above topics.

He has worked on many different projects at U of M, including experiments and simulations of the relativistic magnetrons, initiation mechanism of dielectric flashover at the triple point (metal-dielectric-vacuum junction), simulation of current loss in the convolute of the MA, 100 kV linear transformer driver. He designed, constructed, and optimized the imaging system that allowed time-resolved diagnostics of the plasma dynamics in wire Z-pinch experiments. He also conducted experiments to identify the role of conduction current and the displacement current in causing cancer cell death when



David M. French

these cells are subjected to an electric pulse. He has worked on laser ablation, laser spectroscopy and advanced cathodes. He is currently working on the design and construction of a calibration system for the voltage and current diagnostics used on the linear transformer driver, and on the simulations of the early stages of crossed-field devices.

He enjoys giving guided lab tours to high school students, prospective incoming graduate students, and visitors. He effectively conveys the excitement in our discipline and always leaves a deep impression with the visitors. He has not seen an experiment that he doesn't like.

David French can be reached at dmfrench@umich.edu.

Antonius Indarto



Antonius Indarto

Antonius Indarto was born in Malang, Indonesia in 1980. He received the Bachelor of Engineering degree in Chemical Engineering from the Institut Teknologi Bandung (ITB), Indonesia in 2002. He completed the M.S. degrees in Urban Environmental Management from the Asian Institute of Technology (AIT), Bangkok, Thailand (2005), and Environmental & Process Technology from the Korea Institute of Science and Technology (KIST), Seoul, Korea (2006). In 2007, he received the gold award, given by the KIST in recognition of his excellence in plasma research and development.

Indarto's research is focused on the development of nonthermal plasma application for various chemical processes, both for industrial or environmental purposes. This work has been started in 2003 when he worked with the decomposition of chlorinated volatile organic compounds (CVOCs) and carbon dioxide (CO₂) using various non-thermal plasma devices, such as: dielectric barrier discharge and gliding arc. Indarto published this work, noting that gliding arc plasma has some advantages over other nonthermal plasma devices. He has worked continuously to improve the performance of gliding arc plasma as well as to develop the kinetic mechanism of the decomposition reactions.

Parallel to his work on environmental CVOCs and CO₂ decomposition, Indarto has also joined in two prestigious projects: (1) the utilization of synthesized gas and (2) production of methanol from direct methane oxidation by using non-thermal plasma as the reaction medium.

In 2008, in order to simplify the complexity of plasma-chemical reaction, he proposed a way to calculate the global kinetic of the plasma reactions by analyzing the reaction behavior of each reactant and product (published in the *Journal of Fuel Processing Technology*).

Due to the fact that pure plasma process does not have much benefit for the chemical synthesis process, Indarto tried to introduce some solid catalysts to the plasma environment. One of the most impressive works by him is the synthesis of methanol by direct methane-oxidation reaction with the addition of Cu/Zn/Al catalyst. This work has brought him the prestigious young scientist award of the International Association of Catalysis Societies (IACS) in 2008, presented during the 14th International Congress on Catalysis in Seoul, South Korea.

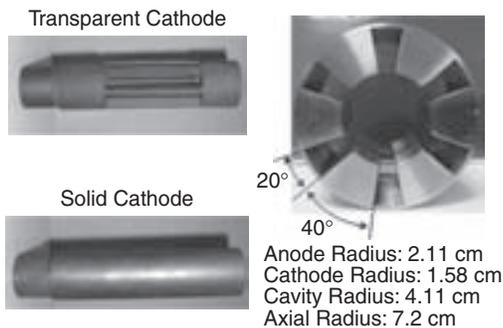
Although he is currently a PhD student, he has served on the editorial boards of three scientific journals: the *Open Journal of Plasma Physics, Chemistry and Chemical Engineering Journal*, and the *Open Catalysis Journal*, and has been a reviewer for a number of scientific journals in the fields of energy, plasma, heat transfer, and chemical engineering. He has written more than 20 peer-reviewed papers. In the future, after finishing his PhD program, he would like to continue the research on plasma-chemistry as he believes that plasma processes, especially nonthermal plasma, could be utilized as an industrial tool for chemical synthesis although much effort will be required.

Antonius Indarto can be reached in the Dipartimento di Chimica Generale e Chimica Organica, Universita di Torino, via Pietro Giuria 7, email: indarto_antonius@yahoo.com

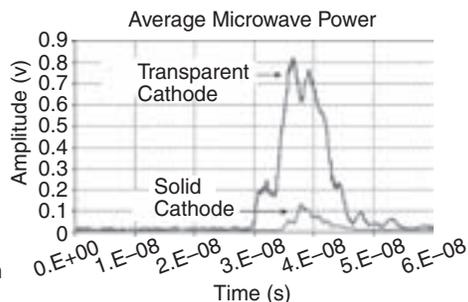
Sarita Prasad

Sarita Prasad is a Fijian citizen. She earned her Associate's Degree in Electrical Engineering in March 1999 from Niihama National College of Technology, Ehime, Japan. She then earned her B.S. degree and her M.S.

degree in Electrical and Electronic Control Engineering in March 2001 and August 2003, respectively, from Nagaoka University of Technology, Niigata, Japan. The title of her M.S. Thesis is: *Computer Simulations on*



A6 Magnetron



Sarita Prasad

Virtual Cathode Oscillator. She joined the Department of Electrical and Computer Engineering at the University of New Mexico (UNM) where she is pursuing her Ph.D. degree under Professor Edl Schamiloglu and is expected to graduate in the Summer of 2009. Her research is focused on the experimental demonstration of the operation of a short pulse magnetron driven by a transparent cathode and the title of her dissertation is: *Improvement of the Output Characteristics of Short-Pulse Magnetrons using the Transparent Cathode.* To-date she has published two refereed journal publications, 11 reviewed conference papers, 14 conference presentations and one patent. She is a student member of the IEEE. She is a recipient of two prestigious scholarship awards from Japan: the full Japanese Government Scholarship (for a period of 4 years) and the Rotary Club of Japan Scholarship (for a period of 2years).

Here is a synopsis of her Ph.D. research. The “transparent cathode” is an innovative cathode developed at UNM for use in relativistic magnetrons [M.I. Fuks† and E. Schamiloglu, “Rapid Start of Oscillations in a Magnetron with a ‘Transparent Cathode’,” *Phys. Rev. Lett.* vol.

95, 205101-1-4 (2005)]. The design and study of the transparent cathode were performed in an attempt to decrease the start time of oscillations in pulsed relativistic magnetrons which, in general, is very slow, making relativistic magnetrons unattractive for short-pulse applications. They have shown using intensive three-dimensional particle-in-cell computer simulations that not only the start time of microwave oscillations is decreased, but also much higher power and efficiency is obtained using the transparent cathode instead of a traditional solid cathode. Recently, Ms. Prasad performed the first experimental demonstration of the performance of the transparent cathode and successfully verified the simulation results on the short-pulse SINUS-6 accelerator at UNM. The figures above show a photograph of the relativistic magnetron and a transparent cathode (left), and data showing the comparison of the average power obtained from the transparent cathode and the conventional solid cathode (right). The result is very impressive.

Sarita Prasad can be reached at the Department of Electrical and Computer Engineering, University of New Mexico, MSC01, 1100, Albuquerque, NM 87131-0001; E-mail: sarita@ece.unm.edu.

Our fate
Perpetual war for
perpetual peace

Gore Vidal

Jacob Zier

Jacob Zier is in his fourth year as a Ph.D. student in the Nuclear Engineering and Radiological Sciences Department at the University of Michigan. He graduated Summa Cum Laude in 2005 with a Bachelor’s degree from the same department, as well as a Master’s degree in Nuclear Engineering in 2007, and a Master’s degree in Electrical Engineering in 2008. Mr. Zier is the recipient of the National Physical Sciences Consortium Pulsed Power Fellowship supported by Sandia National

Laboratories. He has performed summer internships at Lawrence Livermore National Laboratory in 2005 simulating target capsule implosions for the National Ignition Facility, and at Sandia National Laboratories in 2004 simulating shockwave dynamics.

Mr. Zier has worked on several projects at the University of Michigan. He has conducted experiments investigating Z-pinch wire initiation physics and contact resistance using laser backlighting diagnostics, and has designed



Jacob Zier

magnetically insulated transmission line components for low inductance pulsed power experiments. He has performed experiments at Cornell University as a user on the COBRA accelerator facility studying Z-pinch wire plasma ablation dynamics, and has collaborated with Sandia on flash radiography beam characterization experiments. His present research utilizes the first 1

MA Linear Transformer Driver in the USA to explore the magneto-Rayleigh-Taylor instability in high energy density plasmas, and is currently constructing a new sub-nanosecond laser system to diagnose instability growth and stabilization.

He enjoys plasma physics, reading, and keeping physically fit.

Jacob Zier can be reached at jzier@umich.edu.

TECHNICAL COMMITTEE AWARDS

Sergio Cittolin

Computer Applications in Nuclear and Plasma Sciences Award



Sergio Cittolin

Sergio Cittolin was selected by the CANPS Committee to receive the 2009 CANPS award for his “OUTSTANDING VISION AND ACHIEVEMENT in trigger and DAQ architectures for physics experiments over the last 30 years.” Sergio Cittolin has been a CERN applied physicist for the last 40 years. He was the trigger and Data Acquisition team leader for many experiments including PS, ISR, SPS-UA1, and is now project manager of the CMS LHC experiment.

He began in the early 1970s to work with the CAMAC standard, designing hardware modules that became a CERN standard for many PS, ISR and SPS experiments. Later on, he worked on computer interfaces (REMUS) as well as developed hardware and software for a stand-alone test system (Caviar-Bambi and later on MacVEE). He wrote CAMAC library subroutines that have been implemented on a variety of on-line computer systems at CERN and other international HEP physics laboratories. In the 1970s computers ranged from 8-bit microprocessors to 32-bit minis (M6800, HP/1000, PDP11, NORD, VAX), and the CAMAC interfaces included dedicated crate controllers, branch drivers and system crate configurations.

In the 1980s, he was responsible for the data-acquisition system of the UA1 experiment running at the CERN p-pbar collider. This experiment was the first to use a VME-based data readout system and a powerful distributed multiprocessor network. This experiment led to the discovery of the W boson. The experiment leader, Carlo Rubbia, was granted the Nobel prize.

In the 1990s Sergio became the project leader of the trigger and Data Acquisition system for the CMS experiment at the Large Hadron Collider at CERN. Different architectures and switch technologies were evaluated for this system. His vision of the evolution of trigger/DAQ architectures, in particular on event-building technologies and the real time event selection concept (High Level Trigger), was adopted by most physics experiments over the last 30 years. He is internationally known in the Real Time technical community for his many outstanding presentations. He is author or co-author of more than 200 articles and preprints, books and conference proceedings, as well as countless presentations at international workshops and conferences. In addition, he was involved in many multimedia and outreach activities and has demonstrated both real artistic talent and great didactic qualities.

Efthymios Kallos

Particle Accelerator Science and Technology

Doctoral Student Award

The recipient of the IEEE/NPSS 2009 Particle Accelerator Science and Technology Doctoral Student Award is Doctor Efthymios Kallos.

This Award is given to recognize significant and innovative technical contributions to the field of particle accelerator science and technology as demonstrated in a student’s doctoral thesis.

This is the first time this IEEE/NPSS Doctoral Thesis Award is given.

A certificate and a cash award were made at the awards ceremony at 2009 Particle Accelerator Conference in Vancouver. Dr. Kallos presented the work as an invited talk in the awards session of the conference.

Efthymios Kallos completed his undergraduate degree in 2003 at the electrical and computer engineering department in the National and Technical University of Athens, Greece, and his Ph.D. degree in 2008 at the electrical engineering department of the University of Southern California in Los Angeles. His doctoral research work focused on using multiple electron bunches as a tool for the development of next-generation particle accelerators based on plasma wakefields. He was involved in experimentally

demonstrating for the first time the acceleration of a trailing electron bunch in a high-gradient wakefield driven by a preceding bunch, through using bunches short enough to sample a small phase of the plasma wakes. Additionally, he analyzed schemes that utilize multiple bunches to drive the wakefields, showing that the energy of a trailing bunch can be efficiently multiplied in a single stage, thus possibly reducing the total length of an accelerator to a more manageable scale. He is presently a post-doctoral researcher in the Queen Mary University of London, United Kingdom, working on metamaterial-based electromagnetic cloaks.

Citation: *For the demonstration of two-bunch high-gradient acceleration in a plasma wakefield accelerator and the development of novel multi-bunch concepts.*



Efthymios Kallos

AWARD SOLICITATIONS

NUCLEAR MEDICAL AND IMAGING STEERING COMMITTEE HASEGAWA YOUNG INVESTIGATOR AND HOFFMAN MEDICAL IMAGING SCIENTIST AWARDS

These awards are sponsored by the IEEE-NPSS Nuclear Medical and Imaging Sciences Council (NMSIC), which is the steering committee for the annual Medical Imaging Conference(*).

Deadline for application: July 15, 2009

The Bruce H. Hasegawa Young Investigator Medical Imaging Science Award is given annually to a young individual in recognition of significant and innovative technical contributions to the field of medical imaging science. The award consists of \$1,500, a certificate, and a plaque presented at the IEEE NPSS Medical Imaging Conference. Nominees will be judged according to their contributions to medical imaging science as demonstrated by the technical merit and creativity of their research. Priority will be given to nominees

whose research has been published in peer-reviewed journals, especially if the nominee is the first author. Graduate students or other individuals, whose highest degree was awarded no more than six years prior to the date of nomination are eligible.

The Edward J. Hoffman Medical Imaging Scientist Award is given annually to an individual in recognition of outstanding contributions to the field of medical imaging science. The award, consisting of \$3,000, a certificate, and a plaque, is presented at the IEEE Medical Imaging Conference. In selecting the recipient of this award, primary consideration will be given to the impact and innovativeness of a nominee's research in the field of medical imaging science. Other factors include a nominee's research contributions over a career and his/her influence on medical imaging science through education.



Anna Celler
NMISC Awards Chair

Even the ballpoint pen hovering in the background is the knowledge that almost every scientific development of the past has been used for hostile purposes.

Malcolm Dando

Please consider nominating your well-deserving colleagues for the IEEE Nuclear and Plasma Sciences Society and Committee awards. More details and application forms are available on the NPSS awards website: <http://www.ewh.ieee.org/soc/nps/awards.htm>

(*) Held in conjunction with the Nuclear Science Symposium: <http://www.nss-mic.org/2009/NSSMain.asp>

Anna Celler, PhD FCCPM, Chair, NMISC awards subcommittee, can be reached at the Medical Imaging Research Group, Department of Radiology, UBC & Vancouver Coastal Health Research Institute, VGH Research Pavilion, 828 West 10th Avenue, V5Z 1L8 Vancouver, BC; Phone: +1 604-875-5252; Fax: +1 604-875-4376; E-mail: aceller@phas.ubc.ca.

CALL FOR NOMINATIONS

IEEE Medal on Innovations in Healthcare Technology

Deadline: July 1, 2009

Applications are now being accepted for the IEEE Medal on Innovations in Healthcare Technology. The medal will be presented annually to an individual, a team of individuals, or multiple recipients for outstanding contributions and/or innovations in engineering within the fields of medicine, biology, and healthcare technology. The areas of technology that would be eligible for recognition of this award include (but are not limited to) bio-signal processing, biomedical image and image processing (ultrasound, PET, MRI, etc), bio-instrumentation, bio-sensors, bio-micro/nano technologies, bio-informatics, computational biology and systems biology,

cardio-vascular and respiratory systems engineering, neural and rehabilitation engineering, cellular and tissue engineering, bio-materials, bio-robotics, bio-mechanics, therapeutic and diagnostic systems, medical device design and development, healthcare information systems, telemedicine, and emerging technologies in biomedicine (e.g. biophotonics).

Recipients will receive a gold medal, bronze replica, certificate and a \$20,000 honorarium. The submission deadline is July 1, 2009.

For nomination forms and more information, go to the NPSS web site or <http://www.ieee.org/portal/pages/about/awards/noms/healthcare-nom.html>.

OBITUARY

Robert L. Hickok, Jr. 1929-2009



Robert L. Hickok, Jr.
1929–2009

Robert L. Hickok, Jr., pioneer in the development of particle beam diagnostics for magnetically confined plasmas, died April 15, 2009. He was 80.

Bob was born in Schenectady, NY in 1929. He received his B.S. degree in 1951 from Rensselaer Polytechnic Institute, his M.A. degree from Dartmouth in 1953 and his Ph.D. in 1957 also from RPI. All of his degrees were in Physics. From 1957–1959 he was a postdoctoral fellow at Yale, after which he worked at Mobil Research Labs where he began experiments with heavy ion beam probes (HIBP) as a plasma

diagnostic tool. In 1971 he returned to Rensselaer as a professor of electrical engineering, a position he held until his retirement in 1991. From 1991–1997 he continued his work as an active professor emeritus, completing over 35 years of association with his alma mater. For his contributions to plasma diagnostics, he was made a Fellow of the IEEE in 1980 and a Fellow of the American Physical Society in 1984.

The history of HIBP research, begun by Bob with his colleague Buzz Jobes, while they were at Mobil, is a remarkable story that all research physicists and engineers should know as a case

study on how to create and maintain a challenging and fun experimental research program with an exceptionally long lifetime. Bob provided the highlights of this history in the August, 1994 *Special Issue of the IEEE Transactions on Plasma Science*, that was dedicated to him and the work of others he inspired to realize the potential of the HIBP. [R. L. Hickok, "A short history of heavy ion beam probing," *IEEE Trans. on Plasma Science*, vol. 22, p. 287, 1994] As he describes there, he was charged by Mobil to begin a small program relevant to nuclear fusion research. He combined his background and interests in particle beams with a need he perceived for better plasma diagnostics, eventually working out the basic concepts behind the HIBP. His *Physical Review Letter*² (all references are from Bob's History) with Jobes and Marshall in 1969 was received so well that it was selected by the American Institute of Physics for inclusion in their yearly compilation of significant developments in physics and received extensive publicity. The key papers of the Mobil years^{1, 2, 3, 4, 5} show the solid early development done by him and Buzz (who were a great team) and its application on the ST tokamak at Princeton.

Fortunately for RPI and those of us with the good fortune to work and study there, Mobil got out of the fusion business, which led Bob to RPI and Buzz to Princeton. With the help of Bill Jennings and Ken Connor, Bob redirected the research of the Rensselaer Plasma Dynamics Lab (RPDL) to HIBP work^{6,7}, motivated by support from the AEC. The contract obtained in 1972 became the start of an amazing record of support for particle-beam-based diagnostics. While the AEC transitioned to ERDA and then the DOE, the support for this remarkable diagnostic has continued to this day. Besides recognizing the impact the HIBP could have on magnetic confinement fusion research, Bob's big idea was to develop basic ideas at RPI^{10,11,18} and then engage the RPDL group in large research groups at other institutions who were operating experimental confinement devices that could benefit from HIBP measurements. This began with the LITE⁸ mirror device at United Technologies; then moved to Oak Ridge to address EBT⁹, ISX-B^{13,14} and finally ATF¹⁹; to Livermore for TMX¹²; to Texas for TEXT and TEXT-Upgrade^{15,16,17}; and now Wisconsin for MST.

Over 35 years of continuous funding could not have happened if Bob had not also demonstrated an exceptional talent as a mentor. Bill Jennings was the first young colleague at RPI to be guided by Bob, followed by Ken Connor and



Tom Crowley. When Bob retired in 1991, HIBP work was carried on by Ken, Tom and Paul Schoch, who was Bob's student. Now the MST HIBP is directed by Diane Demers and Paul. Other notables in plasma science got their start as research staff under Bob, including Pat Colestock and Spencer Kuo. He also helped establish an exceptional learning environment that has provided a very special experience for the many students who have done their graduate and undergraduate work in the RPDL. Strong working relationships were also established with groups in other countries, especially the HIBP group led by Ludmilla Krupnik in Ukraine and the bumpy torus, stellarator and tokamak groups at Nagoya University and then NIFS in Japan. If Hickok is the father of the HIBP then Krupnik is its mother. The story of her group also is worth knowing.

Bob's impact on HIBP work in Japan is described in a remembrance from Harukazu Iguichi: 'The first theme of my research career was to develop an HIBP for a bumpy torus project. Professor Ikegami, who was participating in the EBT Project at Oak Ridge, had started NBT at Nagoya University. He thought the HIBP was essential since one of the most important physics issues was the effect of radial electric fields on toroidal plasma confinement. In March 1980, Professor Ikegami invited Prof. Connor to Nagoya. Although it was a short stay, it was the first step of our collaboration, which soon brought Dr. Bieniosek to Nagoya as a post-doctoral fellow. I visited RPI in the

So I see
That which is not
observable does
not exist.

Paul Dirac

**Never mind
It is not things in
themselves
which trouble us,
but our opinion
of things.**

Epictetus

beginning of this winter and met Professor Hickok for the first time. The famous professor and HIBP pioneer welcomed a newcomer. He gave me various instructions and materials necessary for HIBP development. In the weekend, he drove his car at 90 miles per hour and took me to Lake George in the north of Troy, NY. I felt that I became one of his graduate students. When I presented our potential measurement in the US/Japan workshop the next year, Professor Hickok admired our quick success. However, our success in this initial phase strongly relied on RPI contributions. The success promoted further collaboration between RPI and our institute. I express my deep gratitude to Professor Hickok.’

The final word from Buzz Jobs: ‘Bob Hickok was my mentor for nine years during which I grew into a physicist who could create good physics experiments. I believe I was his first protégé. I know that subsequently he was

mentor to many younger physicists, creating a whole army of beam probers. I shall keep the memories, but be sad at his passing.’ Additional information on Bob’s career and his impact on others can be found at <http://hibp.ecse.rpi.edu/~connor/RLH/>.

Bob is survived by his wife, Rose Marie Hickok of Potomac, MD; children, Robert L. Hickok, III and his wife Elizabeth Azari of Mullica Hill, NJ, Susan Hickok and her husband Spence Hilton of Millburn, NJ, and Sandra Spalletta of Rockville, MD; grandchildren, Douglas and Rebecca Hilton of Millburn, NJ, and Gavin and Jonathan Spalletta of Rockville, MD; and siblings, Jennie Hickok, Gladys Blanchard and her husband Earl Blanchard, and Rachel Phillips, all of Schenectady, NY.

This article was prepared by Ken Connor, who can be reached at connor@rpi.edu. He was assisted by Buzz Jobs, Harukazu Iguchi and Bill Jennings.

Blunted feelings

Tolerance is a very dull virtue. It is boring. Unlike love, it has always had a bad press. It is negative. It merely means putting up with people, being able to stand things.

E. M. Forster

Unforeseen consequences

The “Sisterhood” was formed back in the early '70s, when, as part of the Women’s Liberation Front, many women started burning their bras. Afterwards they realized they needed to form a group that would offer unconditional support at all times.

Linda Cullen (in 24 Hours)

Sticky wicket

A collage of facts, carefully constructed, can either present a kaleidoscopic truth or a colossal lie.

Joseph Pierce

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expanding the industry, furthering careers*



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