

Nuclear & Plasma Sciences

SOCIETY NEWS

Number 1 • March 2009

CONFERENCES

2009 PARTICLE ACCELERATOR CONFERENCE PAC2009 May 4-8 2009 Vancouver, British Columbia, Canada

The 2009 Particle Accelerator Conference (PAC09) will take place in Canada's beautiful West Coast City of Vancouver, British Columbia from May 4th to 8th, 2009. PAC09 is hosted by TRIUMF, Canada's National Laboratory for Particle and Nuclear Physics, and is jointly sponsored by the NPSS (IEEE) and the DPB (APS).

This well-established conference series is of particular significance to Accelerator Scientists, Engineers, Students and Industrial Vendors interested in conveying and learning the latest developments of all aspects of particle accelerator technology. Some of the topics to be covered include:

- beam dynamics,
- project and subsystems status,
- new proposals,
- advanced accelerator concepts,
- accelerator science from universities and laboratories around the globe.

The Scientific Program will include invited speakers, contributed orals, poster sessions, agency/industry talks on accelerator applications for environment and security and an exciting Student Program. PAC09 is committed to reaching out to young researchers in

the field, and has set a budget to support in part a limited number of qualifying accelerator students.

Key PAC09 organizers include: Paul Schmor (Conference Chair), Shane Koscielniak (Scientific Program Chair), Shirley Reeve (Conference Treasurer) and Yuri Bylinski (Local Organizing Committee Chair). Further details can be found at the PAC09 web site <http://www.triumf.info/hosted/PAC09/index.html>.

The deadline for abstract submission has now passed. The community has responded with 2153 distinct abstracts coming from 1632 distinct primary authors, and 4721 distinct co-authors. These represent 314 institutions (labs, universities & industry) from 36 countries with the USA having submitted 42.9% of the abstracts. The regional distribution is 44.3% from North America, 33.4% from Europe, 20.0% from Asia, 1.1% from South America, 0.8% from the Middle East, 0.4% from Australia and 0.05% from Africa. This remarkable response has ensured that PAC09 will be truly international. Nearly 200 students have sent abstracts for the Sunday, May 3, 2009 student poster session. There are 80 spaces for industrial booths and over 40 have already been reserved.

continued on page 3



Paul Schmor
General Chair



Shane Koscielniak
Scientific Program
Chair



Shirley Reeve
Treasurer



Yuri Bylinski
Local Arrangements
Chair

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Publicity releases for forthcoming meetings, items of interest from local chapters, committee reports, announcements, awards, or other materials requiring society publicity or relevant to NPSS should be submitted to the Newsletter Editor by April 10, 2009 for publication in the June 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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Several satellite meetings are being planned in conjunction with PAC2009, so please check our web site for links and further information.

Vancouver is a beautiful, dynamic city set in a spectacular natural environment. It is one of the few places in the world where you can ski in the morning and golf in the afternoon. Spring-time in Vancouver is particularly beautiful, as the sun reflects off the last remnants of snow on the mountains and sparkles across the ocean below. There are indoor and outdoor activities to please adults, families, couples and friends to no end in this multicultural city. The 2010 Winter Olympics will be less than one year away. Vancouver and Whistler are prepared and excited to host this large international event. Come and share in the enthusiasm and events that are taking place in preparation for the 2010 Winter Olympics.

The Vancouver International Airport has consistently been rated as a top North American airport providing easy access from all over the world. Vancouver is a great walking city - clean, green, safe, and easily accessible - and PAC09 will take place in the heart of downtown, close to shopping, attractions, and the ocean.

I encourage you to browse our web site, book mark it for future reference, and if you are involved in accelerator science and technology, to register and reserve your hotel early.

I look forward to welcoming you to PAC09.

Paul Schmor
PAC09 Conference Chair

16th INTERNATIONAL REAL TIME CONFERENCE RT2009 May 10-15, 2009 Beijing, China

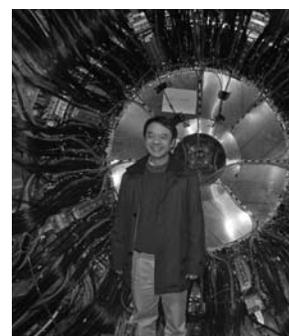
The second IEEE NPSS conference of 2009 will be the 16th International Real Time Conference (RT2009). It will be hosted by the Institute of High Energy Physics (IHEP) in Beijing, China, from May 10 to May 15, 2009. The general chair is Professor Yifang Wang, from IHEP, assisted by co-chair Professor Yantai Shu, from the Tianjing University (TJU). The chair of the local organization committee is Professor Zhen'An Liu, from IHEP.

This is the first time that an NPSS conference will be held in mainland China and it will be a very exciting experience. Following the tradition of RT2007 (Fermilab) and RT2005 (Stockholm, Sweden), the conference will be institute based, with all the activities centered at IHEP. The institute is located about 12 km west of downtown Beijing, with direct access by subway. There is a Holiday-Inn hotel within walking distance of the institute, and the institute also operates a guest house on the site. It takes about half an hour to travel from the institute to Tiananmen Square by subway, and it costs \$0.30. Also, taxis are very inexpensive in Beijing and are probably the most convenient means of transportation. They are numerous and can be

hailed on the street. A ride to downtown will cost about \$5.00. In general, the drivers speak only Chinese, so it is always a good idea to have your destination written with Chinese characters on a card. Renting a car is definitely not a good idea. The driving style in Beijing is bewildering to say the least, for nonlocals.

As usual, all the presentations at the conference will be plenary. This is made possible by the small size of the conference and favors the exchange of ideas between researchers from various fields, who quite frequently face similar experimental problems. The fields covered are rather broad: ultrafast timing, front end signal processing, real-time systems architecture, trigger/DAQ, event building, control and monitoring, online farms and databases, and new standards. These methods are common to many disciplines, such as plasma, nuclear and particle physics, astrophysics, space science, accelerators, medicine and biology.

The conference will open on Sunday, May 10, with one full day of workshops and tutorials. During the week, the first talk of each day will be in the form of a "refresher course." This is to take into account the large audience of students that traditionally attend the RT confer-



Dr Yifang Wang



Dr. Zhen'An Liu



Jean-Pierre Martin

And justice of both?
Truth is independent of fact, always.

Oscar Wilde

ence. We will also continue with the concept of “mini-oral” poster presentations. They proved very successful at RT2005 and RT2007. The “mini-oral” is a 3- minutes /3-slides “publicity spot” where the author can highlight in a plenary session the work presented on his or her poster.

Travelling to China is now much simpler than it used to be. The Olympic games brought incredible improvements in the infrastructure of the Beijing area. Nevertheless, there are visa procedures to follow, and the time required to obtain a visa varies from country to country. Al-

low yourself enough time to get your visa without worry.

Further details about the conference are available on the web site at: <http://www.ihep.ac.cn/english/conference/rt2009/> or by asking Google for RT2009

Jean-Pierre Martin, chair of the Computer Applications in Nuclear and Plasma Science Technical Committee, the NPSS sponsor of the Real Time conferences, 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



36th INTERNATIONAL CONFERENCE ON PLASMA SCIENCE AND 23rd SYMPOSIUM ON FUSION ENGINEERING May 31 to June 5, 2009 San Diego, California, USA

WELCOME

We wish to cordially invite you to the combined International Conference on Plasma Science and Symposium on Fusion Engineering to be held in downtown San Diego, CA from May 31 to June 5, 2009.

Plasma science and fusion engineering encompass a wide range of technical activities,

and we hope the combined nature of the 2009 meeting for both these areas will provide an excellent opportunity for cross-topic interaction. The combined conference is expected to attract 700-800 attendees. Information about the conference can be found on the web page: <http://cer.ucsd.edu/icopssofe09/>.

In addition to the main conference, there



Farhat Beg
ICOPS General
Chair



Mark Tillack
SOFE General Chair



Christine Coverdale
Technical Program
Chair, ICOPS



Rene Raffray
Technical Program
Chair, SOFE

will be two minicourses offered in the areas of Target Fabrication for High Energy Density Physics Experiments, and Fusion Engineering and Design.

The organizers, including the conference chairs, the organizing and technical committees as well as the NPSS encourage you and your companions to attend ICOPS/SOFE 2009 in San Diego.

The conference will have a combined technical program with joint super plenary talks and separate plenary talks. The following topics will be covered:

- Basic Processes in Fully and Partially Ionized Plasmas
- Microwave Generation and Plasma Interaction
- Charged Particle Beams and Sources
- High Energy Density Plasmas and their Interactions
- Industrial, Commercial and Medical Applications of Plasmas
- Plasma Diagnostics
- Pulsed Power and Other Plasma Applications

- ITER and experimental devices
- New device design and reactor studies
- Divertors and plasma materials interactions
- Chambers, vacuum vessels, blankets, and shields
- Diagnostics, data acquisition, and plasma control systems
- Safety and environmental engineering
- Materials assembly, fabrication, and maintenance
- Heating and current drive
- IFE drivers, targets and related technologies
- Power systems
- Magnet engineering
- Electromagnetics and electromechanics

The conference will provide about twenty student grants. Please visit the conference web page at: <http://cer.ucsd.edu/icopsofe09/> or contact Ryan Umstaddt at studenttravel2009@ieec.org for more information.

The conference will have 20-25 exhibits located next to the registration booths and in the hall where poster sessions will be held.

The conference will be held at the Omni Hotel, which is nestled in the heart of the historic Gaslamp Quarter and bathed in Southern California sunshine. An exciting variety of restaurants and bars is only a few minutes' stroll away, and the San Diego Bay provides a stunning backdrop for the conference. Ex-

plore Balboa Park, take a harbor cruise to Coronado or catch a Padres baseball game at PETCO Park; San Diego is an exhilarating place to be.

California's second largest city and the United States' seventh largest, San Diego boasts a citywide population of nearly 1.3 million residents. San Diego is renowned for its idyllic climate, 70 miles of pristine beaches and a dazzling array of world-class family attractions.

San Diego hosts a large variety of attractions for visitors. Popular attractions include the world-famous San Diego Zoo and Wild Animal Park, Sea World San Diego and LEGOLAND California, and Mexico is only 10 miles away. San Diego offers an expansive variety of things to see and do, appealing to guests of all ages from around the world.

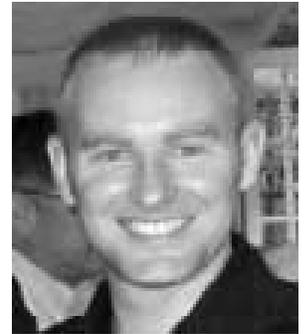
About 2 miles north of downtown in Balboa Park, **San Diego Zoo** is one of the largest, and most progressive zoos in the world with over 4,000 animals of more than 800 species.

Both this and its sister site of San Diego Wild Animal Park in north San Diego State are a truly exciting and educational day out for all the family. Visit www.SanDiegoZoo.org



In addition to the Zoo and over 1,200 acres of lush gardens, Balboa park is also home to 15 major museums, including the **San Diego Natural History Museum**, the **Reuben H. Fleet Science Center**, and the **San Diego Air and Space Museum**. Visit www.balboapark.org for more details.

SeaWorld San Diego is one of the world's premier marine adventure parks with 200 acres of world-class shows, thrilling rides and unforgettable animal encounters. More than 80 million visitors have explored the mysteries of the sea here, with up-close animal interactions. SeaWorld is located 4 miles north-east of downtown and more de-



Simon Bott
Conference Secretary



Kathleen Johnson
Conference Treasurer

**Never
speechless**
When ideas fail,
words come in
very handy.

Unknown



tails can be found at www.seaworld.com/SanDiego.

The nearby San Diego Bay also hosts a variety of attraction for visitors, including **Seaport Village**, and the **Maritime Museum** which hosts the **Star of India**, the oldest working ship in the world, and **HMS Surprise**, featured in the movie *Master and Commander*. In addition, the **USS Midway** aircraft carrier museum is located at Navy Pier on the Bay and provides tours and exhibits of life aboard this famous vessel.

Further afield are some of Southern California's biggest tourist attractions. **Legoland** (www.legoland.com/california.htm) **Disneyland Resort** (www.Disneyland.com), **Univer-**



sal Studios (www.universalstudioshollywood.com), and **Mexico** are all within easy driving distance.

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17th IEEE INTERNATIONAL PULSED POWER CONFERENCE 2009

June 28 – July 2, 2009
Renaissance Mayflower Hotel
Washington, D.C., USA

Washington, D.C., will be the focal point of the international community for Pulsed Power science, technology, and applications when nearly 600 attendees of the 17th IEEE International Pulsed Power Conference (PPC2009) converge on the Renaissance Mayflower Hotel from June 28th through July 2nd, 2009.

The Pulsed Power Conference is held biennially and serves as the principal forum for the exchange of information on pulsed power science, technology and engineering. Historically, the conference has significant international participation, and the location of this 17th meeting in Washington, D.C., will only serve to maintain that tradition. The conference proceedings also serve as the major archival resource of papers published in this field.

The setting for the technical and social events of PPC2009 is the Renaissance Mayflower Hotel, an historic site in the heart of downtown Washington. Built in 1925, the Mayflower Hotel was clearly intended to serve an elegant and powerful clientele, with gold embellishments exceeded only by the Library of Congress building. Still the largest luxury hotel in the District of Columbia, its location in the heart of business and government districts makes it a popular center for high-powered political meetings. The Mayflower has hosted numerous major D.C. social events, including an inaugural ball for every U.S. President since the days of Calvin Coolidge. Coined "D.C.'s second best address" by President Truman when he lived there for the first 90 days of his presidency, the Mayflow-

er is routinely frequented by celebrities, international royalty, and diplomats, because of its atmosphere and access to the corridors of power. With a recent multimillion dollar restoration and upgrade, the Hotel has all the modern amenities that one would expect while maintaining a sense of elegance and charm, justifying its place as a “grand dame” of Washington.

As the U.S. national capital, the District of Columbia is a vibrant city filled with opportunities to explore grand government buildings, monuments, memorials, museums, art, theatre, music, culture, nightlife, and more. There is something for everyone to experience, attendees and companions alike. The Conference will be held within easy walking distance of the National Mall, the focal point for many visitors, lined on all sides with many of the most popular destinations of interest. Here you’ll find the regal U.S. Capitol building with its newly opened 600,000 sq. ft. Visitor Center, a host of Smithsonian museums, and well-recognized monuments, including the Washington, the Lincoln, and the Jefferson Memorials. The D.C. metro subway system is easy to use, has a friendly environment, and can transport the more adventurous to farther flung locales such as the National Zoo, Old Town Alexandria, and the Kennedy Center for the Performing Arts.

In addition to a great venue, the conference will feature a varied technical program which offers a unique opportunity for IEEE members and nonmembers alike to learn more about the technology and science that underpins many of the world’s large science machines. Randy Curry, Technical Program Chair of PPC2009 notes, “We have expanded the conference technical subjects to include a number of exciting new areas. These include Pulsed Power applications in alternative energy, new dielectrics for energy storage, explosive pulsed power sources, as well as industrial, commercial, and medical applications. These emerging areas and ongoing fundamental research provide the basis for new pulsed power applications in fields like fusion, high energy-density physics, and pulsed power sources.”

With an expected 400 oral and poster presentations, PPC2009 speakers will address the following major topics:

- Dielectrics and Energy Storage
- Microwave and RF Sources
- Charged Particle Beams and Sources
- High Energy Density Plasmas
- Pulsed Power Switches and Components
- Power Electronics and Systems
- Industrial, Commercial, and Medical

Applications

- Explosive and Compact Pulsed Power
- Pulsed Power Sources
- Pulsed Power Systems
- Diagnostics

PPC2009 is managed under the auspices of the Pulsed Power Science and Technology (PPS&T) Standing Technical Committee under the NPSS. Edl Schamiloglu, past chair of the 2007 Conference and current chair of the PPS&T Committee spoke of the history of this conference and its impact on the Pulse Power community, “We are truly excited that the 17th IEEE International Pulsed Power Conference will be held in Washington, D.C., during such an historic period in America’s history. The conference venue, located only four blocks from the White House, will allow conference attendees and their companions to witness history while they participate in technical discussions. With such a high density of leading science policy makers in Washington, we will not be surprised if a few take some time to visit our Conference.”

Conference General Chair Frank Peterkin, a Principal Engineer at the Naval Surface Warfare Center in Dahlgren, Virginia, expects large international participation and chose D.C. as the conference venue with foreign attendees in mind. “Our conference has never been held in Washington, D.C., and it’s obviously a very cosmopolitan location, so attendees from any country can find something new to explore and yet still something familiar to make them feel at home. There were more than 30 countries represented at the 2007 conference, and I would anticipate a similar number for PPC2009.”

“U.S. scientists and engineers should also be highly motivated to attend,” Peterkin continued, “The Pulsed Power community in the U.S. is strongly influenced by federal spending on research. A conference attendee can easily schedule other related meetings with sponsoring agencies. In addition, the location is a magnificent tourist attraction, and I’m hoping many attendees will consider bringing their families along. We’ll have a fun companion program to encourage exploration, and we selected the conference schedule to allow for the enjoyment of the National Fourth of July Independence Day celebration immediately afterwards. It will be easy to plan an extended stay and enjoy the nation’s best fireworks show within walking distance of the Conference hotel.”

Students have a chance to enjoy the show too, as PPC2009 has budgeted generously for competitively awarded grants to offset some travel costs. There will also be an extensive Exhibitor Program to offer students and professionals alike



Frank Peterkin
General Chair



Randy Curry
Technical Program Chair



Matt McQuage
Finance Chair



Keisha Hersey
IEEE Meeting Coordinator

Two stage process?
Prior notice is required for all reservations.

Notice in a London restaurant window

more insight to the latest products that industry has to offer and a Job Placement Center to help those seeking new employment opportunities in industry, academia, or federal agencies.

The PPC2009 organizers are working hard to make this a memorable conference, bringing together an enthusiastic international technical community and world-class surroundings to guarantee a rewarding professional and personal experience. For up-to-date information about PPC2009 and a downloadable brochure visit the PPC2009 website at www.ece.missouri.edu/ppc2009.

Frank Peterkin, General Chair of PPC2009 can be reached at fpeterkin@aol.com.



2009 IEEE NSREC Finalizing Plans for Quebec City, Quebec, Canada July 20-24, 2009

The 2009 IEEE Nuclear and Space Radiation Effects Conference will be held July 20-24, 2009 in Quebec City at the Hilton Quebec City and the Quebec City Convention Centre. The conference will feature a Technical Program consisting of nine sessions of contributed papers (both oral and poster) that describe the latest observations and research results in radiation effects, an up-to-date Short Course offered on July 20, a Radiation Effects Data Workshop, and an Industrial Exhibit.

The conference hotel will be the Hilton Québec which is connected by indoor walkways to the convention centre and a concourse of shops. All rooms feature a spectacular view of the city. 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. Supporters of the conference include the Defense Threat Reduction Agency, Sandia National Laboratories, Air Force Research Laboratory, NASA Electronic Parts and Packaging Program, Jet Propulsion Laboratory, Aeroflex Colorado Springs, Boeing, BAE Systems, Honeywell, Micro-RDC, and Northrup Grumman.

TECHNICAL PROGRAM

Chaired by Lew Cohn, Naval Research Laboratory, papers to be presented at this meeting

will describe the effects of space, terrestrial or nuclear radiation on electronic or photonic devices, circuits, sensors, materials and systems, as well as semiconductor processing technology and techniques for producing radiation-tolerant devices and integrated circuits. The conference will be attended by engineers, scientists and managers who are concerned with radiation effects. International participation in the conference is strongly encouraged. Poster and Data Workshop chairs will be Steve McClure, JPL, and Sarah Nation of NSWC-Crane. The Technical Session chairs are:

Basic Mechanisms	Peter Truscott, UK and Scott Messenger, NRL
SEE Devices & ICs	Fernanda Kastensmidt, UFRGS
SEE Mechanisms	Vincent Pouget, IMS
Dosimetry & Facilities	Gyorgy Vizkelethy, SNL
RHBD	Lawrence Clark, ASU
Photonics	Christina Howe, VU
RHA	Craig Hafer, Aeroflex Colorado Springs
Radiation Effects in Devices & ICs	Mike Alles, ISDE
Space & Terrestrial Environments	Greg Ginet, AFRL

RADIATION EFFECTS DATA WORKSHOP

The Radiation Effects Data Workshop is a forum for papers on radiation effects data on

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

PAPER SUBMITTAL

Information on the submission of summaries to the 2009 NSREC for either the Technical Sessions or the Data Workshop can be found at www.nsrec.com. The deadline for submitting summaries is February 6, 2009.

SHORT COURSE

Attendees will have the opportunity to participate in a one-day Short Course on Monday, July 20. The theme for the 2009 short course is: "Selection of Integrated Circuits for Space Systems" and is being organized by Ken LaBel, NASA/GSFC. The course will be of interest both to radiation effects specialists and newcomers to the field alike.

INDUSTRIAL EXHIBIT

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

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Like Pandora's box

After a while you learn that privacy is something you can sell, but you can't buy it back.

Bob Dylan

More often wrong

In war you don't have to be nice - you have only to be right.

Winston Churchill

CONFERENCE REPORTS

FINAL REPORT

2008 NUCLEAR SCIENCE SYMPOSIUM AND MEDICAL IMAGING CONFERENCE

16th Room Temperature Semiconductor X- and Gamma-Ray Detectors Workshop and Special Focus Workshops (Dresden, Germany, 19-25 October, 2008)



Ralf Engels
Conference Coordinator



Ron Keyser
Conference Treasurer



Merry Keyser
*Companion Program
Chair; Student Scholarship
Committee Member*

The 2008 Nuclear Science Symposium, the Medical Imaging Conference, and the Room Temperature Semiconductor Detector Workshop were held successfully during 19-25 October, 2008 at the Maritim Hotel and International Congress Center, Dresden, Germany. Uwe Bratzler (CERN & TMU) was General Chair and Roger Gearhart was his Deputy. As with prior years, the NSS/MIC/RTSD meeting was complimented by ten Short Courses. In addition, we had ten Workshops during the conference week in Dresden and two satellite Workshops outside Dresden just before and after the conference week. "Detector Development for Future Particle Physics and Photon Science Experiment" was held at DESY, Hamburg from 16-17 October and "Hybrid Imaging with MR-PET" at the Forschungszentrum Jülich (FZD), Jülich from 27-28 October.

Over 2,000 abstracts from 57 countries were submitted to the conference with over 1,000 accepted by NSS, 750 by MIC, and 200 by RTSD. The goal of the conference was to promote participation from Eastern Europe and that goal was well met with over 100 abstracts coming from these countries. Over 2,700 scientists and engineers attended the conference, also setting a record for being the largest NSS/MIC/RTSD conference ever. Many favorable comments were offered on the technical program, the social events and on the location in Dresden. The large number of submissions meant some deserving papers could not be accepted. Even with this most difficult complication, the Program Committee put together an exceptional conference covering a broad area of interests to the community.

The Nuclear Science Symposium (NSS) started Monday morning and ended on Friday with 510 oral presentations in 68 five-concurrent parallel sessions and 450 poster presentations in 2 poster sessions. The NSS program chairs, Rolf Heuer (DESY) and Maxim Titov (CEA-

SACLAY) are to be congratulated on overseeing this large program and minimizing the degree of subject overlap. The NSS also featured both opening and closing Plenary Sessions. Three Plenary speakers opened the program. First, Carlos Alejaldre (ITER- Cadarache) presented **The Status of the ITER Design**, then Peter Braun-Munzinger (Darmstadt, GSI, and EMMI) spoke about the **Physics Prospects with the FAIR Facility at GSI**, and the last plenary speaker, Heinz Graafsma (HPAD and XFEL) presented **Recent Highlights from the XFEL Project and Summary of the DESY Workshop**. For the closing session two speakers were invited. First, J.J. Engelen (CERN) presented his thoughts about **Recent Highlights from the Large Hadron Collider Project**, then Sakue Yamada (University of Tokyo, KEK, and the Graduate University for Advanced Studies in Japan) talked about **Recent Highlights from ILC Project**.

The 16th International Workshop on Room-Temperature Semiconductor X- and Gamma-Ray Detectors also started on Monday with 103 oral presentations in 16 plenary sessions and over 90 poster presentations. Chaired admirably by Michael Fiederle (Freiburger Material-forschungszentrum) and Ralph James (BNL), this workshop, known as the RTSD, is held in conjunction with the NSS and MIC every other year, providing an environment for new and fruitful associations between the respective attendees.

The Medical Imaging Conference (MIC) began on Wednesday 22 October and ended on Saturday 25 October, with 108 oral presentations in plenary sessions and 510 poster presentations in 2 poster sessions. Wolfgang Enghardt (OncoRay) and Sibylle Ziegler (Technische Universität München) put together an incredible program. On Wednesday, MIC started with two plenary speakers. First, Michael Baumann (Technische Universität Dresden) presented **Trends in Radiation Oncology: Integrating**

High Precision Treatment with Modern Biology, then Rodney J. Hicks (Peter MacCallum Cancer Centre) talked about **PET as a Platform Technology in Translational Research**. Eike Rietzel (Siemens Healthcare) gave a talk on Thursday 23 October about **Image Guided Precision Radiotherapy: the Technology**. The popular MIC Refresher Courses were continued this year, starting before the morning session began and were well attended.

For the first time in conference history, highly successful contributions bridging the fields of nuclear science detection, medical imaging and solid-state radiation detectors were presented in one dedicated NSS/MIC/RTSD joint session and two NSS-MIC joint sessions. During the NSS/MIC/RTSD Joint Session, David W. Townsend (University of Tennessee) presented **Lost in Translation – From Basic Science to Clinical Reality**.

Posters were of exceptionally high quality and one could find attendees reading posters at just about any time of the day. Other programs included many workshops and many more short courses, some of which were two-day events. These short courses, organized by Claus Grupen (Universität Siegen) and Iréne Buvat (Imaging and Modeling in Neurobiology and Cancerology Lab), provide an essential opportunity for the expert and newcomer alike to be taught by practicing experts. In all, there were 444 short-course attendees.

There were many workshops in the conference center during the conference week excluding the two Satellite Workshops at DESY and Forschungszentrum Jülich, but also two workshops in the nearby art'otel. The Fourth International Workshop on the Molecular Radiology of Breast Cancer (MRBC) Workshop was held over two days, starting on Monday 20 October and X-ray Micro Imaging of Devices, Materials and Organisms was held over three days including a small exhibition started on Wednesday 22 October. All workshops were very well organized and Norbert Wermes (Physikalisches Institut Universität Bonn) with his Co-chair Wim de Boer (Institut für Experimentelle Kernphysik Universität Karlsruhe) did a great job to arrange an attractive Workshop program.

On Sunday 19 October, we had a nice “candlelight” Welcome Reception with a fantastic view of the illuminated Old Town Region. NSS MIC and RTSD had their respective banquets. The NSS luncheon was held at noon on Monday 20 October. During this function, Sara Pozzi,

University of Michigan, presented the Radiation Instrumentation Early Career Award to Grzegorz Deptuch (FermiLab) (see photo). The luncheon speaker, Astronaut Christer Fuglesang (KTH) gave a talk on **A Journey to Space with Radiation and the Future in Mind**. The RTSD Award Committee elected Prof. Arnold Burger (Fisk University) as the recipient of the 2008 RTSD Scientist Award. The Edward J. Hoffman Medical Imaging Scientist Award was presented to Christopher J. Thompson (McGill University) and the Young Investigator Medical Imaging Science Award was presented to Katsuyuki Taguchi, (Johns Hopkins University), (see Society Awards below) on Wednesday 22 October, shortly before the Conference Reception. The RTSD held its lunch at Thursday noon at the Westin hotel. During the MIC dinner, on Friday evening in the Salons of the Westin Bellevue, Uwe Ahrendt (NOMOS Glashütte/SA Roland Schwertner KG) gave a presentation on the Fine Watchmaking in Glashütte, Saxony.



Grzegorz Deptuch receives NSS Award from Sara Pozzi, NSS Awards Chair.



Ken Taguchi and Chris Thompson receive their awards at the 2009 MIC banquet accompanied by Forschungszentrum Dresden-Rossendorf and IEEE NPSS colleagues.

The largest event was the Conference Reception, held on the evening of Wednesday 22 October, using the whole conference center; well over 2400 attendees enjoyed the ambiance. The highlight of the Conference Reception was the nice outside fireworks with the burning letters “IEEE 2008” on the opposite bank of the Elbe River.

Considerable effort was made in seeking financial support for the meeting, to augment income from registration fees. To this end, the conference committee was able to raise close to €80k, a result of the generous donations from institutions and commercial companies; most of this was used to support financially well over 250 students and postdoctoral scientists. Klaus

**Power of arrest
Advertising is
merely the
science of
arresting the
human
intelligence long
enough to get
money.**

**Stephen
Leacock**

Mueller, Merry Keyser and Karla Funke did an outstanding job in distributing the money to successful applicants. Our sincere appreciation to these contributors was acknowledged via the website and a poster showing the respective logos of the institutions and companies.

The three-day Industrial Program, chaired by Friedrich Wulf (Hahn-Meitner-Institut Berlin) featured 63 companies from around the world, enabling the exhibitors to meet the attendees and to demonstrate their products. Attendees who entered the Exhibition area had a nice overview of all the booths. The customer interactions were apparently many and of high quality and the Exhibitors were pleased. The Exhibitor Technical Sessions were well attended with “standing room only” at some sessions. It is encouraging that 15 exhibitors have already contracted for next year’s meeting in Orlando. On Tuesday 21 October, a very nice Exhibitor Reception was held in the Exhibit hall and in the foyer in front in the conference center.

The use of computer facilities at the NSS/MIC/RTSD meeting has steadily increased over the years; Joel Surget, our Computer-support Chair did a great job with the help of many volunteers to manage this critical function. People nowadays are quite concerned that they have steady access to the outside world. Taking full advantage of the number of attendees who bring laptop computers, Smartphones or Blackberry with WiFi capability, in 2008 the conference staff covered the main conference center with a wireless network – including the entire commercial exhibit area and several seating areas especially on the terrace level, as well as our well-known Internet Café with a limited number of computers for those who couldn’t bring their own. The efforts of our NSS/MIC/RTSD technical team were extraordinarily successful. For this conference, our team brought, installed, and operated the entire wireless network along with help from the staff of the Conference Center.

The pleasant vicinity of the venue also led us to put in extra effort to provide an unusual and exciting Companion Program brought together by the Companion Program Chair Merry Keyser and her team of excellent volunteers. The tours were very well attended. We were fortunate that the tour company was very flexible and a large number of participants were able to register for tours on-site. A total of more than 460 attendees and family members took part in the companion program.

One special tour was offered and sold out in advance to visit the Radiation Source ELBE (“Electron Linac for beams with high Brilliance and low Emittance”) at the research center Forschungszentrum Dresden-Rossendorf (FZD). FZD scientists gave an overview of the linac itself as well as the two free-electron lasers connected to it and the variety of secondary radiation available from ELBE: coherent infrared radiation, quasi-monochromatic X-rays, bremsstrahlung, pulsed neutron beams, and pulsed mono-energetic positrons. In addition, they presented the 150 TW laser system, which is located in the ELBE building. This high-intensity laser is used for particle acceleration - a fascinating new topic in the broad spectrum of physics in general and of acceleration technology in particular.

In the area of Special Events we had several smaller meetings such as the **Round Table on Nano CMOS and 3D Electronics for Scientific Instrumentation and Imaging: Opportunities and Practical Aspects** chaired by Erik Heijne, Alessandro Marchioro, and Ray Yarema. For the first time we held a **Marie Curie Fellows: Networking Event with Opportunities to Meet Other Fellows, Senior Colleagues, and EU Representatives** organized by Erik Heijne. Under the patronage of the IAEA, a meeting on **Nuclear Instrumentation for accelerator applications and non-intrusive detection in a changing world** was organized by F. Mulhauser (IAEA), R. Lanza, and G. Nebbia. For the first time at this conference we had a Women In Engineering (WIE) session called **New Challenges and Opportunities for Women Scientists and Engineers in the World of the Internet Era**. See Barbara Obyrk’s report below. We also held a well-attended session on **Technology Transfer and Intellectual Property**. This roundtable was organized by Jean-Marie Le Goff (CERN) and Hartmut Hillemanns, (CERN). Special sessions were also held on **Homeland Security Applications and Nuclear Power Systems**.

The promotion for this meeting was also outstanding due to the efforts of the CIP (our Conference Information and Promotion group) and Dora Merelli of CEA-Saclay. Publicity and Press Chair Christoph Ilgner (CERN) did an excellent job in world-wide conference promotion.

And that brings us to the long list of volunteers who made this meeting such a success. The DVD being out on time is primarily due to the efforts of Paul Sellin (Surrey), our confer-

ence editor, together with help from our web master Bo Yu (BNL). The meeting would not have happened at all without the efforts of our Conference Coordinator, Ralf Engels (FZJ). Our technical team (who did such a great job with our network challenges) was headed up by Dora Merelli, Tony Maeda, Dave Gregonis and staff from our local partner FZD with the guidance of Uwe Konrad (FZD) and Christine Bohnet (FZD).

The registration went very well indeed thanks to Christina Sanders (Registration Chair) and good folks at Intercom and Labten.

This list could go on and on with many volunteers who have not been mentioned, but we are sure we should not forget our Treasurer, Ron Keyser (ORTEC) and his Co-Treasurer Peter Joehnk (Forschungszentrum Dresden Rossendorf) who are still collecting invoices and completing the accounts.

A BRIEF NOTE OF THANKS from the NSS/MIC/RTSD Chairmen

It was a tremendous job to organize and conduct such a huge conference. It would have not been possible without the tireless help of many colleagues. We would like especially to thank the organizing committee, our local hosts at the Forschungszentrum Dresden-Rossendorf, the NSS/MIC Conference Information and Promotion Committee (CIP), the Scientific Program Network, our colleagues of the NPSS Transnational Committee as well as our RISC and NMISC colleagues, and all others who have helped and contributed mightily to the conference's success, a truly great and unforgettable event for our world-wide science and engineering community and for our Society.

Most importantly, special thanks go to the local organizer, Forschungszentrum Dresden Rossendorf (FZD), to our Honorary Chair, Prof. Dr. Roland Sauerbrey, Scientific Director of FZD, and to Dr. h. c. Peter Joehnk, Administrative Director of FZD, for their overall strong support of this important annual meeting of our world-wide science community, and for their untiring efforts throughout the week.

We hope that the main outcome of this third European meeting was an excellent experience where you made new friendships and returned home pleased with your experience. This is the best reward for all the people who did the hard work of the meeting.

This report was prepared and submitted by Ralf Engels who can be reached at R.Engels@FZ-Juelich.de ; Ron Keyser, who can be reached at Ron.Keyser@ametek.com and Merry Keyser who can be reached at rmkeyser@aol.com.

The CIP questionnaire provided feedback indicating that this was not only the largest with close to 3000 attendees, but also one of the most successful conferences, by all metrics, in NSS/MIC/RTSD history.

Detailed information concerning the programs offered and the people involved can be found in the article above and on our conference website at: www.nss-mic.org/2008.

Our most sincere thanks to one and all who have worked long and hard to ensure a highly successful conference. We look forward to the 2009 meeting to be held in Orlando, Florida.

Uwe Bratzler, General Chair, Uwe.Bratzler@cern.ch and Roger Gearhart, Deputy General Chair, ragearthart@comcast.net.

Scientific precision
Only two things are infinite, the universe and human stupidity, and I'm not sure about the former.

Albert Einstein



Uwe Bratzler
General Chair



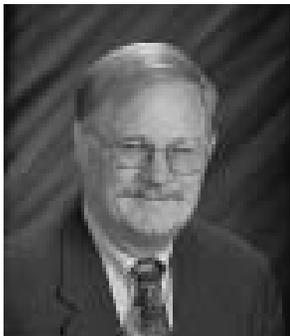
Roger Gearhart
Deputy General Chair

NUCLEAR POWER – BACK ON THE SCENE

Report on the Nuclear Power Session, 2008 Nuclear Science Symposium Dresden, Germany



Christoph Ilgner



Richard Kouzes

Given that a resurgence of interest in nuclear fission as a source of energy is emerging in many countries throughout the world as a result of a growing demand for energy and the simultaneous concerns for production of green house gases from conventional fossil-fuel power plants, the Nuclear Science Symposium and Medical Imaging Conference (NSS-MIC) has reintroduced nuclear power as one of its topics after an absence of several years. Nuclear power is a rapidly growing element in the global energy mix, with some projecting the number of nuclear power plants in the world to grow by a factor three, to 1200 facilities by 2050.

A session on the topic of nuclear power was held on October 20, 2008, at the NSS in Dresden, Germany. The Nuclear Science Symposium is an ideal forum to bring together scientists and engineers working in fields that are highly relevant to development of future reactor concepts, as well as those who are involved with the lifetime extension of facilities. Nuclear fusion was not discussed in the session since there was a plenary presentation on the International Thermonuclear Experimental Reactor (ITER) project.

This nuclear power session was extremely successful, with more than 160 NSS-MIC participants attending the session. The session started with an overview talk by H. Paillere from CEA Saclay, France, on the role of nuclear power for future energy needs. The session also featured contributions on dedicated instrumen-

tation, as well as recent results of thermohydraulic simulations inside the containment of a nuclear power plant, presented by H. J. Allelein from RWTH in Aachen, Germany. After most of the presentations, a lively discussion developed, which continued even after the close of the session.

Sessions on nuclear power are planned to be part of the standard program for future NSS-MIC conferences, with expanded sessions on this topic in the future. Participants working in the field of nuclear power will also benefit from the scientific contributions presented in the other well-established and relevant NSS sessions on Nuclear Measurements and Monitoring Techniques, Neutron Instrumentation, Radiation Damage Effects, Safety Instrumentation, and Homeland Security, among others. The nuclear power sessions will offer scientists and engineers from the nuclear industry a broad forum to present their achievements in instrumentation, control systems, and radiation hardness of materials used in nuclear power plants, to name just a few. The reintroduced nuclear power session can already be considered well embedded into the program of the NSS, providing a complement to dedicated nuclear power community conferences. The planning for the nuclear power sessions at NSS-MIC 2009 in Orlando, Florida is already under way.

This report was prepared by Christoph Ilgner who can be reached at Christoph.Ilgner@physik.tu-dortmund.de and Dick Kouzes, who can be reached at richard.kouzes@pnl.gov.

WOMEN IN ENGINEERING SPECIAL SESSION 2008 IEEE NSS/MIC/RTSD Dresden, Germany

An IEEE Women in Engineering (WIE) Session was held during the 2008 IEEE NSS/MIC/RTSD in Dresden, Germany. Having a large and very international conference with close to 3,000 participants from almost 60 different countries provided an outstanding opportunity for this WIE event. It was the first time in the history of this Conference

that a WIE event was hosted. This took place on Thursday, 23 October 2008, in the evening, and was open to all Conference attendees. The Session, organized by Barbara Obryk (IFJ, Poland) and Maryam Al Thani (WIE R8 Coordinator), has provided the opportunity for exchanging ideas and information on issues of importance not only to the society of women in



Women in Engineering: Panel discussion during the WIE Session in Dresden (from left to right): Hannelies Kluge (DESY), Jane M. Lehr (Sandia National Laboratories, the NPSS President), Joanna Izewska (IAEA), Sara A. Pozzi (University of Michigan), Barbara Obryk (IFJ Krakow), Maryam Al Thani (WIE R8 Coordinator), Francesca Nessi-Tedaldi (ETH Zurich)

science and engineering but of importance to the general public as well. The theme of the Session was: “New challenges and opportunities for women scientists and engineers in the world of the Internet Era.”

At the opening of the Session all attendees were warmly welcomed by Uwe Bratzler, the Conference General Chair. He also shared and forwarded greetings from the Chancellor of Germany, Angela Merkel (a physicist herself), which Dr. Merkel had sent specifically to the organizers and participants of the WIE Session.

Then the WIE Session guests were introduced, including Joanna Izewska of IAEA, Hannelies Kluge of DESY, Jane M. Lehr of Sandia National Laboratories, Francesca Nessi-Tedaldi of ETH Zurich and Sara A. Pozzi of University of Michigan. Presentations began with a talk by Jane Lehr, the NPSS President. It was great that she has shared with the audience her broad experience in the field of merging/joining her scientific work and her dedication to IEEE activities with her family life, with which she has succeeded so well. Then Hannelies Kluge, who is a founding member of the Working Group for Equal Opportunities of the German Physical Society, spoke about the status and best examples of best practice on equal opportunities for female physicists in Germany. Afterwards, Sara A. Pozzi brought the audience from the discovery of nuclear fission to today’s challenges in nuclear energy and nonproliferation with a special emphasis on women contributions to 20th century nuclear physics. Her talk gave an opportunity to present a book edited by Nina Byers and Gary Williams about contributions of 20th-century women to physics: **Out of the Shadows**, which was sent by

Nina Byers (of UCLA, one of 83 women physicists for whom data is archived on the website: Contributions of 20th Century Women to Physics) with her best wishes to the participants.

During the panel discussion, which was moderated by Barbara Obryk among others, Joanna Izewska shared her broad experience with the situation of women working in international organizations such as the one for which she works. Then, Francesca Nessi-Tedaldi presented her very personal experience of raising a family with kids without any interruption in her scientific and professional career; she gave a lot of encouragement to many young women that they do not need to choose between a career and family. Very lively and interesting informal discussions, along with delicious refreshments, completed this very successful WIE event which attracted over 130 participants. – bringing the session room to its capacity limit.

We would like to thank all participants, the outstanding speakers, Brookhaven National Laboratory and NPSS, and the Conference Organization and Conference General Chair, for their contributions and strong support without which this great success would not have been possible.

We have received already encouragement to organize a 2nd WIE Session during the 2009 NSS/MIC in Orlando, FL, and we look forward to seeing you all again in Orlando in October next year.

More information can be found at: <http://spn-nssmic.ifj.edu.pl/wie.html> or please contact Barbara Obryk at barbara.obryk@ifj.edu.pl or Maryam Al Thani at mthani@ieee.org

I come at a high price!
Money is good for bribing yourself through the inconveniences of life.

Gottfried Reinhardt

PRESIDENT'S REPORT



Craig Woody
IEEE NPSS President

It is a great pleasure and an honor to be writing my first message as the new President of the NPSS. This has been a remarkable journey for me, since I started my involvement with the NPSS back in 1975 when I attended my first NPSS-sponsored conference when I was a graduate student at the Stanford Linear Accelerator Center. This was then the Nuclear Science Symposium which was held in San Francisco, and it was the first time I got to hear talks and meet some of the famous people I had been reading about in the field of nuclear instrumentation. I was truly impressed by this, and I quickly realized that this was a field and group of people that I wanted to be a part of. Well, I guess it must have really made an impact, since here it is more than 30 years later, and I now see much more clearly from a different level what a tremendous organization our Society is, and what great benefits it brings to its members. It is the place where you will find your friends, your colleagues, the conferences where you can present your research, the journals where you can publish your papers and find the latest new results, and discover many other exciting opportunities. I'm very proud to be a part of it, and honored to be taking over as its President for the next two years.

I would first like to thank our former President, and my mentor during my transition into my new job, Jane Lehr, who provided us with her outstanding leadership during the last two years, and also Bill Moses, our previous President, who has been a friend, colleague and invaluable resource to our Society for many years. We also have many other talented and competent people in our organization, and I can tell you that our Society is in good hands and in a healthy state as we start the new year.

As I'm sure all of you know, the world economy has been in turmoil during the past several months, and many major companies and institutions have faced some serious financial problems. However, we are very fortunate that both the IEEE and the NPSS have weathered this storm remarkably well so far. Due to our Society's rather substantial financial reserves, which are a result of our being a very well run and efficient organization, we have been able to absorb much of the economic impact of these events and still remain viable. In fact, we were able to utilize an additional part of our reserves to ini-

tiate a new, very prestigious, high level award, which is the Marie Sklodowski Curie Technical Field Award. This award will be given to individuals making outstanding contributions to the field of nuclear and plasma science. It is funded through an endowment of \$600,000 by the NPSS to the IEEE Foundation and carries with it a \$10,000 honorarium, a bronze medal and a certificate. It is an award that spans all the technical fields of interest of our Society, and will be awarded for the first time in 2011. Instructions on how to nominate individuals for this award will be made available soon.

Another major event during the first part of this year was our Society Review, which is a bottoms up, full-scale review of our entire Society that is mandated to be carried out for each IEEE Society every five years. This review took place at the February 12th TAB meeting in San Juan, Puerto Rico. As of this writing, we have just submitted our report to the Society Review Committee describing the state of our Society. Since we are in excellent shape, both organizationally and financially, I expect that this review will go very well. I will be reporting on the outcome of the review in the next Newsletter.

Some other new developments are that we now have a newly formed NPSS Chapter pending in Prague in the Czech Republic, awaiting official IEEE approval. This Chapter was officially formed on December 12, 2008, with Stanislav Pospisil as the Chapter Chair, and is described in a later article in this Newsletter. I would like to thank Uwe Bratzler for spearheading the effort to form this new Chapter. NPSS will now have 14 Chapters worldwide, and we are pursuing new Chapters in Korea, Russia, Belarus and Latin America.

We have also had a few changes in some of Committee Chairs which took effect on January 1st of this year. Chuck Melcher is taking over from Dick Lanza as Chair of Radiation Instrumentation while Dick prepares for the 2009 NSS/MIC Conference as its General Chair. Dan Fleetwood is taking over from Tim Oldham as the Chair of Radiation Effects in July and will officially represent the TC starting next January, John Luginsland is taking over from Ron Gilgenbach as Plasma Sciences Chair, and Stan Schriber is taking over from Ilan Ben Zvi as Chair of Particle Accelerator and Sciences and Technology. Jean-Luc Leray will be taking over from Uwe Bratzler as Chair of the Transnational Committee,

while Uwe becomes our new Membership Chair and Christoph Ilgner begins working on a new program for NPSS for young scientists and engineers (GOLD program). Bill Moses will become our new Awards Chair, as well as Chair of our Conference Committee as Ray Larsen steps down from that position, and Jane Lehr, as our Past President, will become Chair of our Nominations Committee. I would like to thank all of our past Committee Chairs for their devoted efforts in helping NPSS achieve success in all of these areas, and wish all the new Chairs all the best in their new positions. You can read more about our newly elected and appointed AdCom members later in the Newsletter.

SECRETARY'S REPORT

The first thing I would like to note is that this is the first of FOUR Newsletters that you will be receiving this year. The publication schedule is now March, June, September and December since we felt that there was too much of a news gap between September and March; hence I hope you will be thinking of contributions to these issues. Not only do we want conference reports and news of awards and solicitations for papers and award nominations, we are also happy to see articles on areas in our fields of interest written for technical but nonspecialist audiences. Our broad technical community does all sorts of truly fascinating and cutting edge work. Let's share it with each other. And, as always, I look forward to your comments and criticisms to help make this an outstanding Newsletter and of the greatest value to you, our Society members.

The NPSS AdCom met last in Dresden, Germany on October 25, following the biggest NSS/MIC/RTSD conference ever. See the detailed report above. As this was the annual meeting it was one of thanks and goodbyes to some AdCom members who have served well over their terms. These are noted in Craig Woody's report above. It was also the alternate-year AdCom meeting at which we affirmed the election of our new president, Craig Woody, thanked our wonderful past president, Jane Lehr, for her outstanding service, and elected a new Vice

I would again like to thank the membership of NPSS for giving me the opportunity to serve as your President for the next two years, and I promise that I will do my best to keep our Society healthy, active and involved with our community as it has been in the past. I look forward to meeting many of you during my term in office and finding ways to help make our Society serve you better.

Craig Woody, NPSS Society President, can be reached at the 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.

President and President-elect, Bob Reinovsky of Los Alamos National Laboratory.

Because there are many articles detailing other activities and conferences, I will simply highlight actions taken at the meeting:

- It was moved, seconded and passed that, with the intent of bringing the Electromagnetic Launch Symposium under the Pulsed Power Science and Technology Technical Committee, NPSS will technically cosponsor the 2010 Electromagnetic Launch Symposium.
- It was moved, seconded and passed that the NPSS AdCom ExCom (Executive Committee – see definition in our on-line Constitution and Bylaws) shall have the authority to send e-mails to the NPSS membership.

This is also the year in which we will do our assessment of Society membership through a questionnaire. It is important that you reply because it is on the results of this questionnaire that our elected AdCom seats are apportioned. There will also be questions about your satisfaction or otherwise with our society and its publications. It is through your answers that we can make our society and its conferences and publications best meet your professional needs.

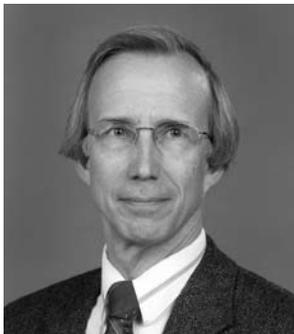
Albe Larsen, NPSS Secretary and Newsletter Editor, can be reached at the SLAC National Accelerator Laboratory, MS66, 2575 Sand Hill Road, Menlo Park, CA 94025; Phone: 650-926-2748; Fax: 650-926-5124; E-mail: amlarsen@slac.stanford.edu.



Albe Dawson Larsen
NPSS Secretary and
Newsletter Editor

NEW AdCom VICE PRESIDENT/ PRESIDENT ELECT

Robert E. Reinovsky



Bob Reinovsky
*NPSS Vice President/
President-elect*

Robert E. Reinovsky is Program Manager for Primary Assessment Technology at Los Alamos National Laboratory, where he is responsible for scientific and programmatic planning, organization and execution of research programs addressing the physics issues and simulation methodologies for one aspect of the nuclear weapons program. Major technical issues include high explosive science; material behavior and properties under extreme conditions; hydrodynamics including implosion hydrodynamics and instabilities; nuclear processes; and high energy density plasma and radiation processes.

Previously he focused on applications of pulsed power to problems in hydrodynamics and material properties. At the same time Bob harbors a career long, and not always well disguised, fascination with the physics and engineering of pulsed power systems that offer such enormous potential for manipulating and investigating the physical world in states ranging from condensed matter to plasmas.

Bob received his Masters degree in Electrical Engineering in 1971 and his Ph.D. in 1973, both, from Rensselaer Polytechnic Institute in the Electrophysics Department where his dissertation work focused on ion beam diagnostics for magnetically confined fusion plasmas.

From 1974–1986, Bob worked at the Air Force Weapons Laboratory (now the AF Research Laboratory) in the areas of plasma and pulsed power physics. At the AFWL, his principal interests were high-density plasma z-pinch implosions, radiation processes, plasma diagnostics, and pulsed power physics. Bob was programmatically responsible for developing and building four generations of the world-class SHIVA family of high-current, low-impedance pulsed power systems, and for developing and demonstrating world-record, fuse-opening switches using these systems.

Techniques in ultra-high-current high-explosive pulsed power developed in Los Alamos, starting in the 1950's, caught his imagination because they offer access to even more

exciting conditions of high energy density. Bob joined Shock Wave Physics Group (M-6) at Los Alamos in 1986 to continue applying these techniques to problems in national defense, plasmas and condensed matter; and to explore the engineering of compact pulsed power systems. Bob led the Shock Wave Physics Group at Los Alamos from 1990 to 1993 and then joined the Los Alamos High Energy Density Physics Program as Project Leader for the Athena Pulsed Power Project and then as Chief Scientist and Deputy Program Manager. From 1998 to 2006 he was the Program Manager for the Pulsed Power Hydrodynamics Program which sponsors the development and construction of the Atlas system and of the Atlas program of liner driven hydrodynamics experiments.

The end of the Cold War and the dissolution of the Soviet Union in 1991 raised significant issues about the stability of the Russian nuclear weapons laboratories and about the future of the world-class scientific staff of those institutions. Bob joined with a few Los Alamos colleagues to establish an active program of unclassified, basic, joint scientific work with these scientists. These efforts, starting in 1992, and continuing to the present, have grown into a vigorous DOE program of joint activities in the areas of pulsed power, material dynamics, and computational mathematics for the mutual benefit of both nations.

Bob is a Fellow of the IEEE, has been elected an Academician in the International Academy of Informatization, and has been awarded the Sakharov Medal by the All Russian Scientific Research Institute of Experimental Physics and the IEEE NPSS Peter Haas Award. He begins a term as Vice President of the IEEE Nuclear and Plasma Sciences Society in Jan 2009.

Bob Reinovsky, IEEE NPSS Vice President, President-elect, can be reached at the Los Alamos National Laboratory, PPH Program Office MS D420, Los Alamos National Laboratory, Los Alamos, NM 87544; Phone: +1 505-667-8214; Fax: 505-665-2828; E-mail: bobr@lanl.gov.

NEW AdCom MEMBERS Class of 2012

In the first issue of 2009 we especially welcome our new AdCom elected members and new Technical Committee chairs. Brief biographies follow for some of the members with whom you may not be familiar or who haven't had recent bios published.

ELECTED AdCom MEMBERS STEVEN H. GOLD Plasma Science and Applications

A recent biography of Steve appeared in the June 2008 issue of the Newsletter when his receipt of the 2008 Richard F. Shea Award was announced. Steve has been active on AdCom in many capacities over the last 5 years, especially as a former PSA elected

member and he continues his activities as the chair of the Chapters and Local Activities Functional Committee and the Distinguished Lecturer Program liaison.

Steven H. Gold can be reached at steven.gold@nrl.navy.mil.



Steven H. Gold

JEAN-LUC LERAY Transnational Committee

Jean-Luc Leray (A'87-SM'95-F'04), is a Research Director in Microelectronics-Radiation Effects at the French Atomic Energy Commissariat (CEA) in Saclay, France. He also serves as assistant technical adviser to the High-Commissioner of Atomic Energy. He earned the Dr. es Sc. (Ph.D.) in physics in Paris in 1989 with a dissertation on the effects of radiation and techniques for hardening CMOS, Silicon on Insulator (SOS, SOI) and GaAs technologies. Since receiving his Ph.D., Jean-Luc has been active in the development of radiation-resistant technologies and circuit designs, for example for the ATLAS and CMS detectors at LHC that detect unprecedented levels of several tens of megarads. He has published more than 80 papers in IEEE-refereed publications on microelectronics and radiation effects. He has taught or organized several short courses at a number of IEEE/NPSS NSREC and IEEE-sponsored RADECS Conferences

(RADIATION and its Effects in Components and Systems), in Europe. He has served in many chairman positions including General Conference chair at RADECS.

He has also been active in several steering committees including the European RADECS Association, and other committees dealing with electronics and instrumentation on fusion (e.g., the International ITER - NIF - LMJ Harsh Environment Workshop, being held in 2007), and on fission for nuclear power plants (e.g., a European Conference to be held in 2009).

Presently, Dr. Leray is serving as the vice-president (elect) of IEEE's France Section (after having founded the NPSS France Chapter in 2001). The Transnational Committee reflects his present engagement as an IEEE Volunteer.

Jean-Luc Leray can be reached at CEA, bat 447, 91191 Gif-sur-Yvette cedex; Phone:+33 1 64 50 20 41 (A: 22 64); Cell +33 6 30 64 33 35; E-mail: Jean-Luc.Leray@ieee.org.



Jean-Luc Leray

TOM K. LEWELLEN Nuclear Medical and Imaging Science and Technology

Tom K. Lewellen received his Ph.D. in Nuclear Physics from the University of Washington in 1972. At that time, he joined the Division of Nuclear Medicine at the University

of Washington working on neutron activation analysis schemes for measuring whole body calcium. Since then, he has worked in many areas of Nuclear Medicine, including detector development (both



Tom Lewellen

PET and SPECT), system development (PET – human and animal systems), simulation software development (the SimSET software package), and general issues in quantitative imaging such as scatter correction in positron volume imaging. The current research is focused on preclinical instrumentation and PET/MR scanner development. He is currently a Professor of Radiology, Electrical Engineering, as well as the director of Nuclear Medicine Physics. In support of IEEE, he has served as chair of the Medical Imaging Conference (1998, local arrangements chair for the NSS/MIC (1999, 2009), general chair for the NSS/MIC (2005),

NMISTC chair (2005-2007), elected member of AdCom (2000 – 2003) and will chair the NSS/MIC site selection committee starting in 2009. He will be NSS/MIC/RTSD local arrangements chair in 2010 and General Chair in 2012. He is a Fellow of the IEEE. For the Society of Nuclear Medicine he has long served on the program committee, heading the instrumentation section in 1995. He has also served in many posts (including president) of the SNM computer and instrumentation section.

Tom K. Lewellen can be reached at tkldog@u.washington.edu.

TECHNICAL COMMITTEE CHAIRS

JOHN W. LUGINSLAND

Plasma Science and Applications



John W. Luginsland

John Luginsland was born in Lansing, Michigan. He received the B.S.E, M.S.E and Ph.D. degrees from the Department of Nuclear Engineering and Radiological Sciences at the University of Michigan in Ann Arbor, Michigan. He has been a member of the IEEE and NPSS since 1994. His doctoral research involved the theoretical and computational analysis of two-beam accelerators, field emission physics and coherent microwave generation. In 1996, he joined the Air Force Research Laboratory at Kirtland AFB, NM – first, as a National Research Council Resident Postdoctoral Research Associate, and later as a staff member in the Center for Plasma Theory and Computation. In 2001, he moved to Science Applications International Corporation as a senior scientist and program manager. In 2003, he joined the staff of NumerEx, LLC of Albuquerque, NM, at a satellite office in Ithaca, NY. He is also an Adjunct Associate Professor at the University of Michigan.

At AFRL, Dr. Luginsland performed research advancing the state-of-the-art in both high power microwave (HPM) sources and high performance computational models of electromagnetic devices. He led a team in basic research of multidimensional space-charge limited flows that led to mitigation of pulse shortening in the magnetically insulated line oscillator. He also participated in the development of ICEPIC, a massively parallel electromagnetic particle-in-cell code, with applications to HPM sources. He and his colleagues were honored with the Air Force's Advanced Technology Development Award during this time. At SAIC, Dr. Luginsland

developed parametric design tools for advanced survivability systems, which remain in use today. He was also a program manager and test planner at a live fire facility focused on integrating technology into next generation platforms. At NumerEx, Dr. Luginsland has applied computation plasma physics to support experimental technology development in both industrial and governmental settings, with particular focus on compact HPM sources, emission physics, MHD effects in survivability systems and novel energetic materials, electrically enhanced combustion and propulsion, quantum vacuum nanoelectronics, and multi-scale computational methods. His wider interests include the coupling of parametric and first-principles software, high performance computing, evolutionary algorithms for optimization, and application of virtual prototyping to speed development and deployment of electromagnetic high technology products.

Dr. Luginsland has served one tour on the Executive Committee of the Plasma Applications and Science Committee. He was the lead author for the computational physics chapter of **Advances in High Power Microwave Sources and Technology** (Piscataway, NJ: IEEE, 2001), edited by R.J. Barker and E. Schamiloglu. In 2006, he was honored with the IEEE NPSS Early Achievement Award. In 2008, he was a guest editor of the Special Issue on HPM Generation, published biennially by IEEE Transactions on Plasma Science.

John W. Luginsland can be reached at NumerEx, 401 E. State St., Suite 404, Ithaca, NY 14850; Phone: +1 607 277 4272; Fax: +1 607 272 1927; E-mail: John.Luginsland@NumerEx-LLC.com

CHUCK MELCHER

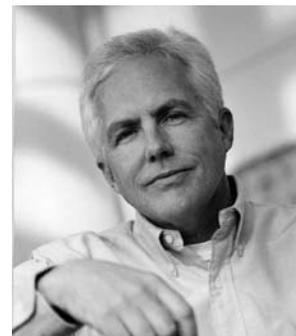
Radiation Instrumentation Technical Committee

Chuck Melcher is the Director of the Scintillation Materials Research Center at the University of Tennessee. He received his B.A. degree in physics from Rice University in 1974 and his M.A. and Ph.D. degrees in solid-state physics from Washington University in 1976 and 1980 respectively. He was a post-doc at Caltech for three years working in heavy ion sputtering and planetary science in the Kellogg Radiation Laboratory before joining Schlumberger-Doll Research in 1983. As a Program Leader and Senior Scientist at Schlumberger he led a group that focused on crystal growth and characterization of new scintillation and semiconductor detector materials for applications in oil well logging. As a direct result of his involvement with the NSS/MIC, he developed a growing interest in medical imaging, and in 1996 he joined CTI Molecular Imaging where he concentrated on developing LSO scintillators for positron emission tomography. His main research interests continue to be the synthesis, mechanisms, and

applications of new scintillation materials for medical imaging, homeland security, and geophysical exploration.

Chuck has been an active member of the IEEE and the NPSS for about 25 years. Prior to becoming Chair of the Radiation Instrumentation Technical Committee, he served as Vice Chair for three years and on the Bylaws Committee. He has served as an Associate Editor of the Transactions on Nuclear Science since 2005 and was the Guest Editor of the SCINT 2007 special issue of the Transactions. He is a Senior Member of the IEEE and received the NPSS Merit Award in 2006. He has frequently served in various NSS/MIC capacities including Program Committee member, Topic Convener, and Session Chair, and now looks forward to his new role as Chair of the RITC.

Chuck Melcher may be reached at the University of Tennessee, Scintillation Materials Research Center, Knoxville, TN 37996-2000; phone +1 865 974 0254, fax +1 865 974 4998, E-mail cmelcher@utk.edu.



Chuck Melcher

TECHNICAL COMMITTEES

NUCLEAR MEDICAL AND IMAGING SCIENCES NEWS

The medical imaging community has been deeply saddened by the loss of our colleague Robert N. Beck of the University of Chicago, one of the pioneers in the field, and the first recipient the Edward J. Hoffman Medical Imaging Scientist Award, our most prestigious award. See below in this Newsletter for his obituary.

An election for five new members of the NMIS Council was held in October. Our new members are Irène Buvat, Georges El Fakhri, Kris Iniewski, Ronald Jaszczak, and Ray Muzic, Jr. We welcome them and thank our outgoing members Anna Celler, Magnus Dahlbom, James Hugg, Yuan-Chuan Tai, and Dimitris Visvikis for their service. 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.

The term of Ronald Jaszczak, one of our two NPSS AdCom representatives, expired this year and an election for his successor was won by Tom Lewellen. We congratulate Tom

and express our sincere thanks to Ron for his four years of active, effective representation of us on AdCom, especially his work as a liaison to the IEEE Special Interest Group on Bio & Health Sciences, and the IEEE Biometrics Council.

I would also like to express our appreciation to Craig Woody, the outgoing Chair of the Joint NSS/MIC Oversight Subcommittee of NMISC and RISC. The Oversight Subcommittee is responsible for selecting the site and General Chair of future NSS/MIC meetings, and Craig has put in a great deal of work in the past few years guiding us to the successful selection of several sites. Craig is resigning in order to assume his duties as the incoming President of the Society. Tom Lewellen will be taking over as the new Chair of the Oversight Subcommittee.

The annual meeting of the NMISC was held October 23, 2008 in Dresden, Germany, in conjunction with the MIC. Following are some of the highlights:



Charles C. Watson
NMIS Chair

Gulled again
Philosophy of
science is about
as useful to
scientists as
ornithology is to
birds.

*Richard
Feynman*

The NMISC passed three motions to AdCom during the year: that the values of the Edward J Hoffman Medical Imaging Scientist Award and the Young Investigator Medical Imaging Science Award be increased to \$3000 and \$1500 respectively, and that the Young Investigator Award be renamed in honor of Bruce Hasegawa. These motions have been approved by NPSS AdCom and are awaiting final approval by the IEEE Technical Activities Board in early 2009.

Paul Kinahan, Chair of the Awards Subcommittee, announced that the 2008 Edward J Hoffman Medical Imaging Scientist Award winner was Christopher J. Thompson “for contributions to the development of positron emission tomography systems.” The Young Investigator Medical Imaging Science Award winner was Katsuyuki “Ken” Taguchi “for contributions to multi-slice x-ray CT, cardiac CT, and four-dimensional CT imaging.” Congratulations to Chris and Ken for these well-deserved honors, and our sincere thanks to Paul, who is stepping down as Awards Chair, for his very effective service over the past three years. Paul will be succeeded as Awards Chair by Anna Celler.

Eric Frey, 2007 MIC Program Chair, gave us a final report on this meeting. It’s too lengthy to reproduce here in full, but a few highlights are: a total of 564 papers (84% of submissions) were accepted to the MIC, with 144 oral and 420 poster presentations; there were 20 parallel oral sessions and 4 poster sessions over 4 days; a popular innovation was the early morning tutorials on topics of high interest; there were 1750 paid registrants to the NSS/MIC and the conference was financially successful with total income of nearly \$1.25M USD.

The 2008 MIC Program Chair, Wolfgang Enghardt, gave us an update on the on-going meeting. 619 papers (81% of submissions) were accepted to the MIC with 99 oral and 520 poster presentations. These were presented in 12 non-parallel oral sessions and 2 poster sessions. There were approximately 2500 paid registrants to the 2008 NSS/MIC, making it the largest ever. The winner of the MIC Student Paper Award was G. Pratz, et al., “Fast, Accurate and Shift-Varying Line Projections for Iterative Reconstruction Using the GPU” (M06-309), and the runner-up award went to C. Thibaudeau, et al., “Iterative CT Reconstruction Using LabPET™ Detector Modules” (M06-361).

Patrick Le Dù, the NPSS Transnational Committee's Conference Liaison, presented

an interesting analysis of trends in recent NSS/MIC meeting statistics. The meeting continues to grow rapidly in size. It’s consistently significantly larger when held in Europe than it is in North America. Asia-Pacific participation appears to be growing. These data are valuable to inform our discussions of how growth and location of the meeting should be managed.

Ron Jaszczak presented a report on his AdCom activities. A Biometrics Council has formed in IEEE and is organizing conferences, but so far there is not much overlap with the MIC. AdCom continues working to get NIH-funded articles published in the IEEE Trans. Nucl. Sci. to become publicly available in PubMed Central within 12 months, as required by NIH. NPSS has created a prestigious new Marie Sklodowska-Curie Award that comes with a bronze medal and a \$10,000 cash prize. Ron also suggested we give attention to creating an overarching web site for NSS/MIC that describes what we do and is more consistent with NPSS and other IEEE web sites, particularly to help give us greater visibility as part of the new IEEE Bio SIG.

Craig Woody gave us a report on the work of his Joint NSS/MIC Oversight Subcommittee and solicited input from NMISC. He described the factors considered when choosing a site and discussed the process followed for the selection of Valencia in 2011. The NMISC expressed some concern over the rising cost of attending the meeting and how this impacts regional attendance. Craig described considerations going into the decisions for 2012 and 2013.

Finally, here’s an update on plans for future Medical Imaging Conferences:

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. Program planning for the Medical Imaging Conference is well under way. 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 short courses, and we anticipate a very exciting program.

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 itself will be held in the spacious Knoxville Convention Center, but housing will be distributed among several downtown hotels. The organizing committee is complete and held its first meeting during the Dresden MIC in October.

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

Following several site visits and much discussion, the Oversight Subcommittee has voted to hold the 2012 meeting at the Disney Hotel in Anaheim, California. Although adjacent to Disneyland, the Disney atmosphere there is subdued, and it was felt to have marginal advantages over returning to San Di-

ego, the most competitive alternative. Tom Lewellen has volunteered to be General Chair of this meeting.

At the meeting of the Oversight Subcommittee in Dresden, we received three formal proposals for the site of the 2013 meeting: one for Beijing, China, one for Seoul, Korea, and one for Cairns, Australia. A proposal for Japan is also expected. The site selection process has barely begun, but this 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/>.

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.

NUCLEAR AND SPACE RADIATION EFFECTS NEWS

Outstanding Papers at the 2008 Nuclear and Space Radiation Effects Conference

2008 NSREC OUTSTANDING CONFERENCE PAPER AWARD:

Enhanced Proton and Neutron Induced Degradation and Its Impact on Hardness Assurance Testing, M.R. Shaneyfelt, J. A. Felix, P.E. Dodd, J.R. Schwank, S.M. Dalton, J. Baggio, V. Ferlet-Cavrois, P. Paillet and E.W. Blackmore.

2008 OUTSTANDING STUDENT PAPER AWARD:

Key Contributions to the Cross Section of NAND Flash Memories Irradiated with Heavy Ions, M. Bagatin, S. Gerardin, G. Cellere, A. Paccagnella, A. Visconti, S. Beltrami, R. Harboe-Sorensen and A. Virtanen.

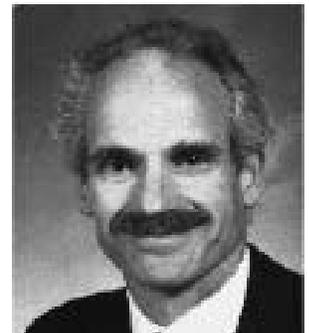
CO-WINNERS FOR THE 2008 OUTSTANDING DATA WORKSHOP PRESENTATION AWARD:

Compendium of Test Results of Single Event Effects Conducted by the Jet Propulsion Laboratory, G Allen.

Investigation of the Mechanism of Stuck Bits in High Capacity SDRAMs, by the Jet Propulsion Laboratory, L. Scheick, S. Guertin and D. Nguyen.

MEMBER-AT-LARGE ELECTED

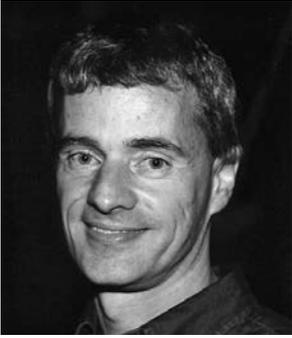
Mike Xapsos is a research physicist in the Radiation Effects and Analysis Group at NASA Goddard Space Flight Center where he oversees work in the space radiation environment. This involves developing models of the environment and evaluating radiation requirements for NASA missions. He is the Project Scientist for the Living With a Star (LWS) Space Environment Testbeds (SET) Project, responsible for its scientific objective of improving the performance of space hardware. Prior to joining NASA in 2001 he worked in the Radiation Effects Branch at the Naval Research Laboratory, where he also researched problems in device radiation physics. He holds a Bachelor's degree in physics and chemistry from Canisius



Tim Oldham
Radiation Effects Chair



Teresa Farris
*Vice-Chairperson of
Publicity*



Mike Xapsos
Member-at-Large

College and a Ph.D. degree in physics from the University of Notre Dame. He has held the position of Guest Editor for the IEEE Transactions on Nuclear Science December Issue, Technical Program Chairman for the IEEE Nuclear and Space Radiation Effects Conference, and General Chairman for the Aerospace Single Event Effects Symposium. He

has published over 75 technical papers and holds 1 US patent.

Tim Oldham, Chair of the Radiation Effects TC can be reached at Code 561.4, Bldg 22 Room 048, NASA Goddard Space Flight Center, Greenbelt, MD 20771-0001; Phone: +1 301 286 5489; Fax: +1 301 286 4699. Teresa Farris can be reached at Teresa.Farris@Aeroflex.com.

FUNCTIONAL COMMITTEES

CHAPTERS

On Friday, 12 December 2008, the General Assembly of the IEEE Czechoslovakia Section in Prague took official action to initiate the formation of a new NPSS Chapter.

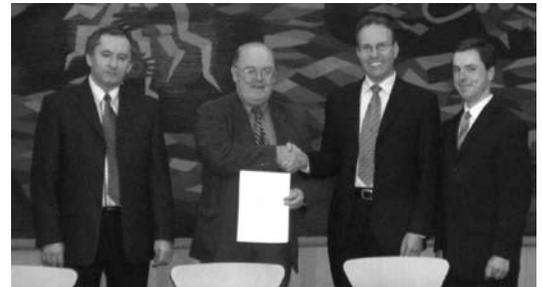
With over 50 IEEE members present from the Czech Republic and Slovakia, leaders from the IEEE Czechoslovakia Section and the NPS Society welcomed Stanislav Pospisil as Chair of the newly formed NPSS Chapter representing nuclear scientists from both the Czech Republic and Slovakia. This new chapter will be the sixth Chapter of the Czechoslovakia Section.

Pospisil has been both an IEEE and NPSS member since 2000 and has been very active in the NSS/MIC community for many years. He is the Director of the Institute for Experimental and Applied Physics (IEAP) of the Czech Technical University (CTU) in Prague. His institute has been a strong supporter of the IEEE and NPSS activities for several years, most recently through contributions to the 2008 IEEE NSS/MIC/RTSD in Dresden, Germany.

The initiative to form the Chapter began about two years ago when Uwe Bratzler, in his function as Region-8 Chapter Coordinator for Division 4, Past Chair of the NPSS Transnational Committee and as General Chair of the 2008 NSS/MIC/RTSD in Dresden, Germany, started reaching out to Central and Eastern European countries. Through this effort, Brat-

zler established closer connections with other IEEE members in Prague. Discussion regarding the new NPSS chapter began at a 2007 meeting in Prague by Pospisil, Bratzler, and Jan Šístek, then Chair of the IEEE Czechoslovakia Section. Since then this group has been working consistently toward the formation of this new Chapter.

On Friday, 12 December 2008, at the General Assembly of the Czechoslovakia Section in Prague, with the signature of 13 chapter members, and approval of the Section, the petition to form a new chapter was ready for submission to IEEE for approval. Once this new chapter is official, NPSS will have 14 chapters world-wide.



From left to right: Lubomír Brančik (Czechoslovakia Section Chair), Stanislav Pospisil (Chair of the new NPSS Chapter), Uwe Bratzler (Region-8 Chapter Coordinator, Div. 4) and Jan Šístek (Section Vice-Chair).

PUBLICATIONS

2009 and 2010 Special Issues / IEEE Transactions on Plasma Science

April 2009: Special Issue on Plenary and Invited papers from ICOPS-2008 – Co-Guest Editors: Gerd Gantenbein (Forschungszentrum Karlsruhe, Institute for Pulsed Power and Microwave Technology, Karlsruhe, Germany), Stefan Illy (Forschungszentrum Karlsruhe, Institute for Pulsed Power and Microwave Technology, Karlsruhe, Germany), and Georg Müller (Forschungszentrum Karlsruhe, Institute for Pulsed Power and Microwave Technology, Karlsruhe, Germany).

June 2009: Special Issue on Atmospheric-Pressure Plasmas: Science and Applications – Guest Editor: Kurt Becker (Polytechnic Institute of New York University, Brooklyn, NY, USA).

July 2009: Special Issue on Plasma-Based Surface Modification and Treatment Technologies – Co-Guest Editors: Ken Yukimura (Doshisha University, Kyoto, Japan), Xiubo Tian (Harbin Institute of Technology, Harbin, China) and Paul Chu (City University of Hong Kong, Hong Kong, China).

August 2009: Special Issue on Advances in Plasma Processing for Semiconductor Manufacturing – Co-Guest Editors: Steven Shannon (North Carolina State University, Raleigh, NC, USA), Shahid Rauf (Applied Materials Inc., Sunnyvale, CA USA), Alex Paterson (Lam Research Corporation, Fremont, CA USA), Ron Kinder (Novellus Systems, Inc., San Jose CA USA), & Peter L.G. Ventzek (Tokyo Electron, Austin, TX, USA).

August 2009: Special Issue on Electrical Discharges in Vacuum – Guest Editor: Rene Smeets (KEMA, Arnheim, the Netherlands).

October 2009: Special Issue on High Power Particle Beams – Co-Guest Editors: Weihua Jiang (Tsinghua University, Beijing, People's Republic of China), Bruce Weber (Naval Research Laboratory, Washington DC USA) & John Mankowski (Texas Tech University, Lubbock, TX, USA)

December 2009: Special Issue on Plasma Assisted Combustion – Co-Guest Editors: Louis Rosocha (Los Alamos National Laboratory [retired], Los Alamos NM USA) and Igor Matveev (Applied Plasma Technologies, Falls Church, VA, USA).

December 2009: Special Issue on Megagauss Magnetic Fields and Their Applications (tentative) – Co-Guest Editors: TBD.

Month TBD – 2010: Special Issue on 10th Workshop on Plasma Based Ion Implantation and Deposition – Co-Guest Editors: Mario Ueda (National Institute for Space Research, São José dos Campos, SP, Brazil) and Joaquim J. Barroso (National Institute for Space Research, São José dos Campos, SP, Brazil).

Month TBD – 2010: Special Issue of Selected Papers from Electromagnetic Launch Symposium – Guest Editor: Harry Fair (University of Texas, Austin, TX, USA).

January 2010: Special Issue on Z-Pinch Physics – Guest Editors: Simon Bott (University of California, San Diego, CA USA), Jerry Chittenden (Imperial College, London, UK), John Giuliani (Naval Research Laboratory, Washington, D.C. USA), and Christine Coverdale (Sandia National Laboratories, Albuquerque, NM, USA).

April 2010: Special Issue on Plenary and Invited papers from ICOPS-2009 – Co-Guest Editors: TBD.

April 2010: Special Issue of Selected Papers from SOFE '09 – Guest Editor: David Ruzic (University of Illinois, Champaign-Urbana, IL, USA)

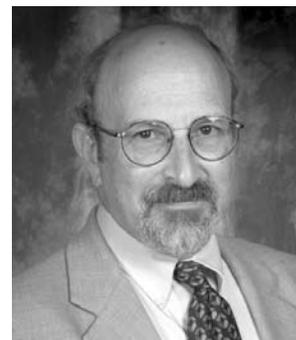
April 2010: Special Issue on Dusty Plasmas -- Guest Editors: Mihaly Horanyi (University of Colorado, Boulder, CO USA), Scott Robertson (University of Colorado, Boulder, CO USA), and Zoltan Sternovsky (University of Colorado, Boulder, CO, USA)

June 2010: Special Issue on High Power Microwave Generation – Guest Editors (tbd)

August 2010: Special Issue on Nonthermal Medical/Biological Treatments Using Ionized Gases and Electromagnetic Fields – Guest Editors (tbd)

October 2010: Special Issue on Pulsed Power Science and Technology – Guest Editors (tbd)

December 2010: Special Issue on Plasma Assisted Combustion – Co-Guest Editors: Louis Rosocha (Los Alamos National Laboratory [retired], Los Alamos, NM, USA) and Igor Matveev (Applied Plasma Technologies, Falls Church, VA, USA)



Steve Gitomer
TPS Editor-in-Chief

Steve Gitomer can be reached at sgitomer@aol.com.

LIAISONS



Randy Brill
Biometrics Council
Liaison



Ron Jaszczak
Biometrics Council
Liaison

BIOMETRICS COUNCIL

A meeting of the newly formed IEEE Biometrics Council Administrative Committee (AdCom) was held via teleconference on Wednesday, 13 August 2008. A slate of candidates for the Biometrics Council Officers was developed to be submitted to members by a mail ballot. A face to face meeting of the AdCom was suggested to be held at selected Biometrics technical conference or workshop, and the venue will be selected by polling members. A draft of the By-laws and constitution for the Council has now been prepared. NPSS has two liaison members to this newly created IEEE group because of potentially overlapping technical interests.

A meeting of the Second International Conference on Biometrics was held in Washington, D.C. Sept. 29 - Oct. 1, 2008: The meeting covered

theory, applications and systems focused on biometrics including advances in fundamental pattern recognition techniques relevant to biometrics, new biometric algorithms and / or technologies, analysis of specific applications, and analysis of the social impacts of biometrics technology.

Inspection of the program reveals that the meeting included primarily papers on finger print analysis, and eye scanning methods with a clear focus on homeland security applications.

It does not seem that there is much if any overlap with ongoing or planned NPSS activities but we will monitor the Biometrics Council activities and coordinate when relevant areas of capability and interest arise.

Randy Brill and Ron Jaszczak, the Biometrics Council liaisons, can be reached, respectively at aaron.brill@vanderbilt.edu and rjj@dec3.duhs.duke.edu.

AWARDS

The IEEE offers Institute Awards, and most societies and Society Technical Committees also offer awards. Elevation to IEEE Fellow is a prestigious honor awarded each year to no more than 0.1% of the full IEEE membership by the Institute Board of Directors. Nominations are made from among Senior Members and nominees must be supported by at least six Fellows. After being reviewed and ranked by the appropriate IEEE Society, the nominations are forwarded to the Institute's Fellow Committee who then recommend a list of candidates to the IEEE Board of Directors for their consideration. The Nuclear and Plasma Sciences Society is justifiably proud of its Fellows. We present here the Class of 2008 Fellows, and wish them each our heartfelt congratulations.

2008 NPSS FELLOWS

Ilan Ben-Zvi



Ilan Ben-Zvi

Ilan Ben-Zvi, a senior physicist at the U.S. Department of Energy's Brookhaven National Laboratory, has been recognized as an IEEE Fellow.

Ben-Zvi heads the superconducting accelerator and electron cooling group at BNL's Collider-Accelerator Department, where he is pursuing the development of state-of-the-art superconducting radio frequency accelerator elements and high-current, high-brightness electron beams.

As director of Brookhaven Lab's Accelerator Test Facility (ATF) for 15 years, Ben-Zvi saw it develop as the premiere advanced accelerator physics facility in the world. Working at the ATF, Ben-Zvi developed devices and techniques for improving free electron lasers, instruments used

to study a wide variety of materials and chemical reactions, and devices for more efficiently operating accelerators for physics research.

After earning a Ph.D. in physics from the Weizmann Institute of Science, Israel, in 1970, Ben-Zvi went to Stanford University, where he helped develop superconducting linear accelerators. In 1975, he returned to Weizmann and founded a cryogenic technology laboratory. From 1980-1982, Ben-Zvi was a visiting associate professor of physics at Stony Brook University. He helped to establish an accelerator at Stony Brook, and he invented and developed accelerator systems now used throughout the world.

Ben-Zvi joined Brookhaven Lab as a visiting physicist in 1988 and rose through the ranks to become a senior physicist in 1997. He served

as head of Brookhaven's Accelerator Test Facility from 1992 to 2007, and he is currently the associate chair for superconducting accelerator R&D at Brookhaven's Collider-Accelerator Department as well as an adjunct professor of physics at Stony Brook.

In addition to becoming a new IEEE Fellow, Ben-Zvi is also a Fellow of both the American Association for the Advancement of Science and the American Physical Society. He is also the recipient of the IEEE Accelerator Science and Technology Award in 1999 and the IEEE Nuclear & Plasma Sciences Society Merit Award in 2008. He received Brookhaven

Lab's Science and Technology Award in 2001 and the Free Electron Laser Prize in 2007, sponsored by the International Free Electron Laser Conference. He has served in leading roles in many scientific meetings and panels, including the National Academy of Science and FEL'95 PAC'99 and FEL'01 international meetings. He is the author or coauthor of over 375 publications.

Citation: For leadership in superconducting accelerators, high brightness electron sources and free electron lasers.

Ilan Ben-Zvi can be reached at Brookhaven National Laboratory.

Dennis B. Brown

Dennis Brown received his ScD from the Massachusetts Institute of Technology in 1967 and was a long-term employee of the Naval Research Laboratory where he served from July 1967 to February 2006. At the NRL he specialized in the use of electrons, Co-60 photons and X-rays for testing and analysis of materials and devices, calculation and measurement of the output of radiation sources, and the measurement and understanding of damaging effects of electrons and radiation on devices.

He has published on the following subjects: the time and energy dependence of irradiation effects, dose enhancement, the kinetics of interface state generation, annealing of trapped charge, and mechanisms of low dose-rate effects

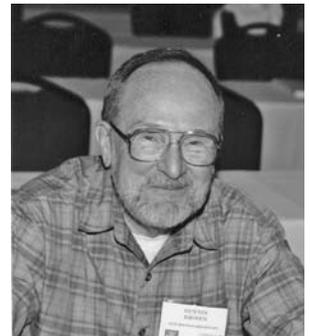
in bipolar devices. In addition to radiation effects work, his research interests include: study and modeling of x-ray generation, x-ray diffraction, x-ray film sensitivity, electron transport, and radiation energy deposition.

From July 1998 through February 2006 he was assigned from NRL to the National Reconnaissance Office where he managed technology development in radiation hardened components, RF and optical technology, and inflatable-rigidizable space structures.

Dr. Brown retired in 2006 with over 40 years of US Government Service.

Citation: For contributions to radiation effects in semiconductor devices for space microelectronics.

Dennis Brown can be reached at brownden_1@yahoo.com.



Dennis B. Brown

Cor Claeys

Cor Claeys received the electrical-mechanical engineering degree in 1974 and the Ph.D. degree in 1979, both from the Katholieke Universiteit Leuven (KU Leuven), Belgium. From 1974 to 1984 he was a Research Assistant and Staff Member, respectively, of the ESAT Laboratory of the KU Leuven and since 1990, a Professor. In 1984, he joined IMEC as Head of Silicon Processing Group. Since 1990 he was Head of the research group on Radiation Effects, Cryogenic Electronics and Noise Studies. Recently, he became as Director Advanced Semiconductor Technologies responsible for Strategic Relations. He is also member of the European Expert Group on Nanosciences. His main interests are in general silicon technology for ULSI, device

physics, including low-temperature operation, low-frequency noise phenomena and radiation effects, and defect engineering and material characterization. He coedited the books, Low Temperature Electronics and Germanium-Based Technologies: From Materials to Devices and wrote a monograph on Radiation Effects in Advanced Semiconductor Materials and Devices (in 2008 translated into Chinese). He also authored and co-authored eight book chapters and more than 800 technical papers and conference contributions related to the above fields. He has been involved in the organization of a large number of international conferences and edited more than 40 Proceedings Volumes. He is an associated Editor for the Journal of the Electrochemical Society. He had short stays as



Cor Claeys

Visiting Professor at the Queens University in Belfast, Ireland, and the University of Calabria, Italy.

Prof. Claeys is a Fellow of IEEE and of the Electrochemical Society. He was the founder of the IEEE Electron Devices Benelux Chapter, was Chair of the IEEE Benelux Section, was in the period 1999-2005 elected AdCom member of the Electron Devices Society (EDS), and was EDS Vice-President for Chapters and Regions during 2000-2006. Since 2000 he has been an EDS Distinguished Lecturer. In 2006, he was elected as EDS President-Elect and became EDS President in 2008. He also received the IEEE Third Millennium Medal. Within the Electrochemical Society he has served on different committees and was Chair of the Electronics Division (2001-2003). In 1999 he was elected as Academician and Professor of the In-

ternational Information Academy. In 2004 he received the Electronics Division Award of the Electrochemical Society.

In the field of radiation he has focused mainly on radiation effects in electronic devices (CCD's, image sensors, deep submicron CMOS, Gate-all-around devices, strained-engineered technologies, FinFETs, Ge and III-V technologies, etc) and was involved in several European Space Agency (ESA) Projects. He will be the Program Chair of the 10th RADECS meeting, organized in September 2009 in Bruges, Belgium.

Citation: For contributions to semiconductor device physics, defect engineering, and low frequency noise characterization

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Gerald Cooperstein



Gerald Cooperstein

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

Dr. Cooperstein has an exceptional record of achievement for over three decades in the technology and applications of high-voltage pulsed-power with emphasis on intense electron and ion beam generation. His most distinctive contributions started with understanding the role of ions in self-pinched electron beam diodes which led to the first experiments on generation, focusing and transport of high current (~0.5 MA) ion beams in the mid 70's. This work helped spawn light ion beam Inertial Confinement Fusion research at Sandia National Laboratories and in several countries around the world. More recently, he and his group are using these intense ion beams to generate intense pulses of characteristic gamma-

rays and neutrons for the detection of special nuclear material. In the 80's, he contributed to the first demonstration of power multiplication using both short- and long-conduction-time plasma opening switches, offering the promise of compact, inductively-driven pulsed power generators. Again, this work spawned numerous research efforts around the world. His most distinctive contribution is the development of the rod-pinch diode where his research efforts and managerial leadership over the last decade have led to major improvements in the intensity and spot size of intense pulsed x-ray radiography sources.

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

Citation: For contributions to pulsed power and intense electron and ion beam technologies and development of x-ray sources for pulsed radiography.

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Francis Dawson

Francis Dawson (S'86-M'87) received the BS degree in physics and the BS MS and Ph.D degrees in electrical engineering from the University of Toronto in 1978, 1982, 1985, and 1988, respectively.

He worked as a process control engineer in the pulp and paper, rubber and textile industries during the period 1978-1980. From 1982 to 1984 he acted as a consultant on various projects. Development areas included high-frequency link power supplies, power supplies for specialized applications and high current protection circuits. Since 1988 he has been with the Department of Electrical and Computer Engineering, University of Toronto where he is engaged in teaching and research.

His areas of research interest include static power converters and their applications, signal processing in power engineering applications and device or process modeling. He has also participated as a Consultant or Project Leader in several industrial projects.

Dr. Dawson is a member of the Association of Professional Engineers of Ontario.

Dr. Dawson's primary contributions are the advancement of multi-physics modeling for the design of arc source systems and the advancement of algorithms for series arc fault detection. He is one of the first investigators to (a) develop a design methodology for a high pressure dc arc lamp that allows lamp designers to couple the physics of the cathode sheath and glass enclosure to a multi-species plasma governed by the species continuity, momentum balance and energy balance equations, (b) to develop procedures for designing pulsed dc sources for high pressure arcs (c) to propose and validate an algorithm that can detect series arc faults reliably without false detection.

Citation: For contributions to modeling of excitation and detection of electrical arcs.

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Francis Dawson

Lars Eriksson

Lars Eriksson got his Ph.D in Nuclear Physics at the University of Stockholm, Sweden in 1973.

His career has spanned the entire history of PET, beginning with his work at UCLA in the mid 1970s working on the first generation PET system with the first images emerging in April-May of 1976. He then developed a higher resolution system consisting of a single ring of NaI(Tl) detectors with co-workers at the Karolinska Institutet/Hospital in 1976-1978. His and his colleagues' development of a second-generation system was done in collaboration with Scanditronix with multiple rings of high efficiency BGO-based detectors in order to achieve the higher sensitivity needed for clinical applications. Higher spatial resolution was achieved in the mid-1980s using an innovative approach of dual scintillator GSO/BGO phoswich detectors, also with Scanditronix. This design was used in a whole body scanner delivered to the Cancer Clinic in Heidelberg and a brain scanner delivered to the NIH in Washing-

ton, D.C. In the following years, 1985-1987, Eriksson's collaboration with Scanditronix led to the development of the modified BGO block detector concept, and then a fourth generation system in 1988-1989 with block detectors and a large axial field of view. This model, originally ordered by the Max Planck Institute in Cologne, was later used as a template for the General Electric Advance system following GE's purchase of Scanditronix in 1990. Since 1997 Dr. Eriksson has worked at CTI (which merged with Siemens in 2005) on the design of numerous PET systems. This includes the phoswich panel system of the High Resolution Research Tomograph, the leading PET scanner for brain research, as well as a SPECT/PET panel design based on a combination of NaI(Tl) and LSO(Ce) block detectors. Image results from this design received the Image of the Year award at the Society for Nuclear Medicine meeting in Toronto in 1998. The quest for higher sensitivity in PET systems has continued and resulted in several IEEE presentations and



Lars Eriksson

in presentations at the Imaging 2003 and Imaging 2006 conferences in Stockholm.

Citation: For development of instrumentation

and methodologies for molecular imaging.

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'Henry' Sung-Cheng Huang



'Henry' Sung-Cheng Huang

Dr. (Henry) S.-C. Huang is a pioneer in the development and application of positron emission tomography (PET). He got his BSEE degree from National Taiwan University in 1966, and did his graduate study at Washington University in St. Louis, where he received his Doctor of Science degree in electrical engineering and biomedical engineering in 1973. He was a vital member in the early development of PET at Washington University, and had an important role in the early CT development at Picker Corp. Since 1977, he has been with UCLA nuclear medicine. He has applied engineering principles and methods to advance the biological quantitation of biomedical images and has made distinguished contributions. In the 70's, he helped advance the tomography reconstruction for the PET scanners that Drs. Mike Phelps and Ed Hoffman developed. He helped devise photon attenuation correction schemes for PET. He has also addressed a series of quantification issues in PET imaging. He further used kinetic modeling to convert radioactivity measurements of PET to biological information to provide images of biological parameters, such as cerebral metabolic rate of glucose, cerebral blood flow, oxygen utilization rate, neuroreceptor density, . . . etc, in terms of absolute units. His work has demonstrated the *in vivo* quantitative functional imaging capability of PET that continues to be recognized as a unique characteristic of PET. He has constantly advocated biomedical imaging as a rigorous measurement tool/science.

Dr. Huang led the way in using compartmental models to describe the kinetics of radio-labeled tracers in local tissue regions that are measurable by emission tomography. His early work on FDG has shown that regional tissue metabolism can be measured, in absolute units of mg/min/g, *in vivo* in man. His work has shaped how glucose utilization rate in local tissue is mea-

sured *in vivo* with imaging today. He has also developed models and study methodologies for many other PET tracers. Many of these models and associated processing methods are still used routinely, in research and in clinical settings, for quantification of various biological functions. He continues to develop methodologies to make the extracted quantitative kinetic information to be clinically relevant.

Dr. Huang has collaborated with biologists/physicians to demonstrate the value of quantitative biomedical imaging and to advance our understanding of the biological changes in many diseases. His collaborative work with nuclear cardiologists showed that the combined use of FDG and N-13 ammonia PET could differentiate ischemic from infarct myocardium. His collaborative studies with neurosurgeons showed that metabolic alteration after brain trauma is different between gray and white matter. His current collaborative work continues to make major impacts on other disorders, such as Alzheimer Disease.

Dr. Huang continues to work on the quantitation of mouse PET images. His research group is developing non-invasive methods to derive input function in mouse PET studies, techniques (e.g., image mapping to ROI template) to automate the quantitation procedure, and systems for easy integration of biomedical data/information from multiple sources.

Under the tutelage of Dr. Huang, many graduate students and postdocs/fellows in biomedical physics, biomathematics and nuclear medicine are now prominent international scientific leaders or investigators, who are making key advancements in kinetic modeling, PET, molecular imaging, and biomedical engineering education.

Citation: For contributions to kinetic modeling and biological quantification in positron emission tomography

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Ravindra Joshi

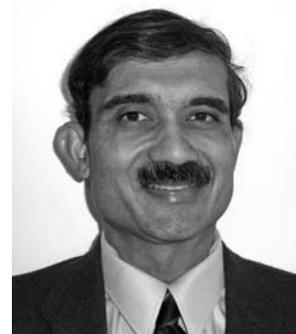
R.P. Joshi received his B.Tech. and M.Tech. degrees in Electrical Engineering from the Indian Institute of Technology in 1983 and 1985, respectively. He received his Ph.D., also in Electrical Engineering, from Arizona State University in 1988. From 1988 to 1989, he was a Post Doctoral Fellow with the Center for Solid State Electronics Research at Arizona State University. In 1989, he joined Old Dominion University, and is currently a Professor in the Department of Electrical and Computer Engineering at Old Dominion. He has been a visiting scientist at Oak Ridge National Laboratory, AFRL Laboratory, Motorola and NASA Goddard.

His research broadly encompasses modeling and simulations of bio-electrics and bio-physics; charge transport in semiconductors, liquids and gases; non-equilibrium high-field phenomena including breakdown physics, and bio-cellular mechanisms such as apoptosis and signal transduction. He has used Monte Carlo methods for

simulations of high-field transport in bulk and quantum-well semiconductors, and Molecular Dynamic approaches for bio-cellular responses to high-power, ultrashort electric pulses. He has one patent and over 120 refereed publications. He served as a Guest Editor of two Special Issues of the IEEE Transactions on Plasma Science on Nonthermal Medical/Biological Treatments Using Ionized Gases and Electric Fields (August 2004, and August 2008). He has been on the Executive Committee for the IEEE Conference on Electrical Insulation and Dielectric Phenomena (2008 and 2009).

Citation: For contributions to bio-electrics and simulation of cellular responses to pulsed power excitation.

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Ravindra Joshi

Mounir Laroussi

Mounir Laroussi received his Ph.D. in Electrical Engineering from the University of Tennessee, Knoxville in 1988. After a Post-Doc and few years of teaching, he joined the Microwave & Plasma Laboratory of the University of Tennessee as a Research Assistant Professor from 1995 to 1998. He then joined the Applied Research Center of Old Dominion University (ODU) in 1998 as a research scientist. From 2002 until 2007 he was an Associate Professor in ODU's Electrical and Computer Engineering Department. In January 2007 Dr. Laroussi became the Director of ODU's Laser & Plasma Engineering Institute (LPEI) and in 2008 he was promoted to Full Professor in the ECE Department, ODU.

Dr. Laroussi's research interests are in the Physical Electronics area and particularly in the physics and applications of nonequilibrium gaseous discharges including the biomedical applications of nonthermal plasmas. He has more than 100 publications in journals and conference proceedings, and holds 4 patents. He served as an elected member of the Administrative Committee (2002-2005) and the Plasma Science and Applications Executive Committee (2005-2007) of the IEEE

Nuclear and Plasma Science Society (NPSS). He has also served as a Guest Editor of the IEEE Transactions on Plasma Science, as session organizer at the International Conference on Plasma Science for many years, and as a Guest Editor of "Plasma Processes and Polymers." Dr. Laroussi was the recipient of the 1996 Advanced Technology Award, from the Inventors Clubs of America, the recipient of the IEEE Millennium Medal Award, 2000, the recipient of the Excellence in Research Award from the Batten College of Engineering and Technology, Old Dominion University, May 2005, the recipient of the Excellence in Teaching Award from the Electrical and Computer Engineering Department, Old Dominion University, June 2006, and the recipient of the Excellence in Innovation Award from the Hampton Road Technology Council, May 2006. In January 2008 Dr. Laroussi was named as an IEEE-NPSS Distinguished Lecturer, and in November 2008 he was elevated to the rank of IEEE Fellow.

Citation: For contributions to biomedical applications of low temperature atmospheric pressure plasmas.

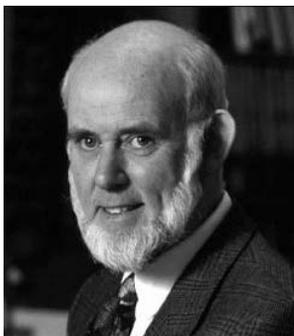
Mounir Laroussi can be reached at mlarouss@odu.edu.



Mounir Laroussi

SOCIETY AWARDS

Christopher J. Thompson Edward J. Hoffman Medical Imaging Scientist Award



Chris Thompson

For over 30 years Christopher J. Thompson has been an innovator advancing the design and development of PET imaging systems, making significant contributions that have shaped the way in which PET systems operate to this day. In 1978 he and his team constructed the first BGO-based PET system, the Positome II, which demonstrated that BGO was a viable scintillator for PET applications and had significant sensitivity gains as compared with NaI(Tl) based detectors. For the 20 years following this work BGO remained the premier scintillator for PET imaging applications.

In 1994, Chris published the first paper describing the concept of Positron Emission Mammography (PEM) based on two planar detectors positioned above and below the breast. This work led to the construction of a prototype PEM system integrated with an x-ray mammography unit and formed the basis for the PEM Flex system manufactured by Naviscan PET Systems. This device was the first high-resolution PET system designed specifically for imaging small body parts to obtain FDA clearance.

Chris has continuously worked to improve PET image quality through both hardware and software solutions. By recognizing that spatial under-sampling leads to reduced spatial resolution, he first worked on detector ring wobbling techniques to improve spatial sampling and later developed depth-of-interaction capable detectors to improve spatial sampling with a

stationary ring. Patient motion in PET studies is a major source of error and loss of resolution. In response to this, he developed techniques for correcting for subject motion in PET scanning by triggering new acquisition frames when the subject moved. Chris was among the first to demonstrate the utility of now commonly used Monte Carlo simulation techniques in PET. The PETSIM Monte Carlo package he developed was used successfully by his and other groups to optimize PET system designs. Chris realized that out-of-field activity degraded the quality of brain PET studies through increased randoms counts. To counter this problem, he developed the "NeuroShield" to reduce the effects of out-of-field activity and demonstrated a 35% increase in the noise equivalent count rate for brain studies. Most recently, Chris developed a timing alignment probe to aid in the timing calibration of time-of-flight PET systems, which is very relevant given the recent clinical introduction of TOF systems.

Throughout his career, Chris has published nearly 100 peer reviewed papers and holds 10 patents related to PET imaging. In his 30 years as a faculty member at McGill University he has supervised 24 master's and Ph.D. students, most of whom have gone on to work in imaging technology development or as medical physicists.

Chris Thompson retired from McGill last year and is now a post-retirement professor. He continues to work on PET detectors in his basement in Montreal, Canada. Email: christopher.thompson@mcgill.ca

Katsuyuki 'Ken' Taguchi Young Investigator Medical Imaging Award



Katsuyuki 'Ken' Taguchi

Katsuyuki "Ken" Taguchi is unique in that he has made significant scientific contributions in the development of algorithms for cardiac, multi-slice, and four-dimensional x-ray CT imaging in both industry and academia. After receiving his Master of Science from Tokyo Institute of Technology in 1991, Ken joined Toshiba where he remained until 2005. His work on the multi-slice CT project began in 1994 and he very quickly

began work on algorithms that were incorporated into the 4-, 8-, 16-, and 64-slice x-ray CT scanners developed by Toshiba. In one of his first projects, he developed an algorithm for multi-slice CT in which cone-beam data could be reformulated into reconstructions of a stack of fan beam geometries. He was one of the first to propose the use of multi-slice CT for cardiac imaging developing an algorithm that used projections only during the cardiac phase of

interest. These works were published in Medical Physics. In 1998-2000, Ken spent a year and a half at the University of Utah as a visiting scientist. It was during this time that Toshiba introduced their first multi-slice CT scanner (4 slices) implementing both of Ken's published algorithms in this scanner. While in Utah, he developed a cone beam reconstruction algorithm that reformatted helical cone beam data into Radon planar integrals using a combination of spherical harmonics and Grangeat's formulation. In 2000, he returned to Japan where he continued working full time for Toshiba. Working long hours at Toshiba and at the same time trying to finish his Ph.D. thesis, he implemented cone beam algorithms of the extended Feldkamp-type in the Toshiba 8-, and 16-slice scanners. Ken finished his Ph.D. thesis in 2002 and moved to Chicago to work for Toshiba America Medical Systems where he developed a direct cone beam reconstruction algorithm that was implemented in the Aquilion64 for cardiac imaging. The algorithm was able to eliminate the characteristic

banding artifact seen in the multi-slice CT cardiac images. In 2005, Ken moved on to Johns Hopkins University to join the Medical Physics Group of Benjamin Tsui, Ph.D. where he has continued to work on x-ray CT algorithms. His motion correction algorithm developed with Professor Kudo was published in IEEE Transactions on Medical Imaging in 2008. His present projects include: time-resolved cardiac 4D CT imaging, CT imaging with photon counting x-ray detectors, and quantitative interventional tumor oncology using C-arm CT imaging. He is presently Assistant Professor of Radiology at Johns Hopkins University and is funded by NIH, American Heart Association, and Siemens. In addition to his impressive record of peer reviewed publications (15), Ken has 25 US patents and 90 Japanese patents.

Katsuyuki "Ken" Taguchi can be reached at *Johns Hopkins University, Department of Radiology, 601 North Caroline Street, JHOC 4253A, Baltimore, MD 21287. 433-287-2974. ktaguchi@jhmi.edu.*

Who's that?
The more often we are given to contemplating ourselves in the mirror, the less likely we are to recognize ourselves in the street.

David Kipp

AWARD SOLICITATIONS

NMISC 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 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.

Please consider nominating your well-deserving colleagues for the IEEE Nuclear and Plasma Sciences Society and Committee awards.



Anna Celler
NMISC Awards Chair

In a rut
People make such a big thing of living and it really isn't that important... You go to bed at night and you fall asleep and it's all over. Then you wake up the next day and you have to start all over again.

Andy Warhol



Serhat Altunc

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, Ph.D. FCCPM, Chair, NMISC

awards subcommittee, can be reached at 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.

SPECIAL ARTICLE

Subnanosecond Pulsed-Power Generated Electric Fields for Cancer Treatment

Serhat Altunc, Ph.D.

Abstract—This article summarizes ongoing research on the use of pulsed power-generated electric fields as a delicate tool for skin cancer treatment. A prolate-spheroidal impulse radiating antenna is used as a noninvasive technique for generating an electromagnetic implosion to kill melanoma cells.

Index Terms—Pulsed-power generated electric field, Impulse radiating antennas, Cancer treatment

INTRODUCTION

HIGH-intensity nanosecond pulsed power-generated electric fields have been used in a variety of biological applications and have initiated the establishment of a brand new research area called bioelectrics. Bioelectrics combines two distinct disciplines: pulsed high voltage engineering and cell biology [1-4].

Millions of people around the world are dying each year because of cancer. Even though considerable progress has been made in treating several forms of this disease, we need to develop safer, cheaper, more effective, and less invasive treatment methods.

The effects of intense electrical pulses on biological cells provide a new tool for therapeutic applications such as cancer treatments and gene therapy. Needle arrays have been used for treating melanoma tumors using pulsed electric fields. This, however, is an invasive approach, resulting in discomfort to the patient. Impulse radiating antennas (IRA) are now being investigated as a noninvasive pulsed electric field delivery system for skin cancer treatment. IRAs can deliver a subnanosecond pulse into tissue with a spatial resolution in the centimeter range and even in the millimeter range with the use of a focusing electromagnetic lens [5]. In addition, IRAs can deliver subnanosecond electric fields to melanoma tissues that are not easily accessible with needles. Most recently it has been shown that such pulsed electric fields cause shrinkage and even complete elimination of melanoma tu-

mors [1-4]. A prolate-spheroidal IRA (psIRA) can be used to obtain electromagnetic focusing on the target to reduce the damage to the tissue layers surrounding the target and skin [5-9].

BACKGROUND AND MOTIVATION

Intense nanosecond electric pulses (nEPs) provide a new tool for cancer treatment, gene therapy, etc. For example, nEP can induce apoptosis in mammalian cells. One promising result is the discovery, by the Frank Reidy Center for Bioelectrics at Old Dominion University (<http://www.odu.edu/engr/bioelectrics/>), that nEPs can destroy tumors in mice [1-3].

Pulsed electric fields of 10's kV amplitude delivered in nanoseconds or shorter timescale are an exciting new development in the biomedical field. nEPs have shown the potential to kill skin cancer cells and also allow the insertion of new genes into living cells with the aim of correcting genetic defects. The initial method of applying such electric fields, through implantable electrodes, is a limiting factor with respect to practical applications. A psIRA can be used as a noninvasive cancer treatment tool, opening up the subnanosecond pulse regime, which is thought to offer greater treatment advantages [1-2].

A cell can be modeled as an electrical circuit as in Fig. 1 [4]. One can model the various cell membranes by their capacitances. The cytoplasm and organelles can be modeled by their resistances. The cytoplasm is conductive,

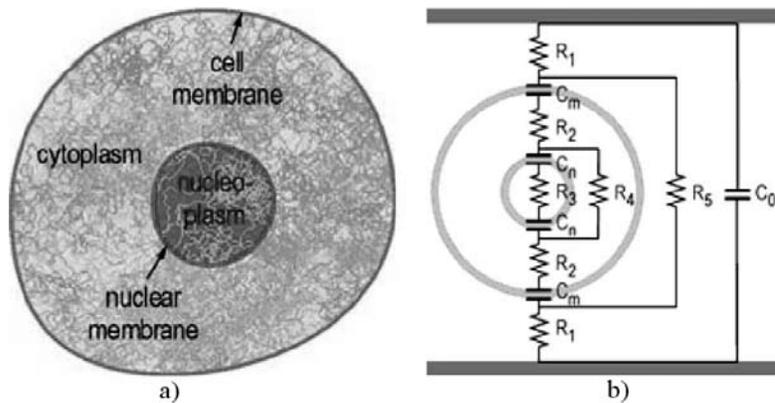


Figure 1. (a) Structure of a biological cell (as would be seen with a light microscope). (b) Double-shell model of a biological cell and superimposed equivalent circuit of the cell [4].

whereas the membranes have low conductivity. Therefore, one can model the cell as a conductor surrounded by an ideally insulating envelope. Embedded proteins in the membrane serve as valves or channels for ions.

While investigating the effect of the electrical pulses on the biological tissues, one should consider four important characteristics that determine their precise effects on the cells. These characteristics are pulse rise time, pulse duration, the number of pulses, and the amplitude of the electric field pulses. Most pulsed electric field effects act on the plasma membrane. The plasma membrane charging time, 100 ns, constitutes a significant division in addressing pulsed electric field effects on biological cells. A sub-nanosecond duration electric pulse (sEP) will pass through the membrane into the cytoplasm because the sEP has a faster rise time than most mammalian plasma membrane charging time. If we apply long duration pulses compared to the charging time of the capacitor formed by the outer membrane, just the outer membrane will be charged and the electric field between subcellular membranes will be zero for a fully insulating outer membrane. However, in practice, we will also have potential differences between subcellular membranes. This effect will be significant if the pulse rise time is shorter. If the sEP has a sufficiently large amplitude it can have significant effects on organelles [1,2].

When the amplitude of the pulsed electric field is increased beyond the threshold required for voltage-gating effects, but with a pulse duration that is shorter than the charging time of the plasma membrane, an effect at the cell membrane called electroporation occurs [3]. It is believed that this effect creates openings in the cell membrane, allowing for the transfer

of large molecules across the cell membrane. Electroporation is generally reversible and even useful, unless the pulse amplitude is too large and/or its duration too long. The electroporation effect can be used for chemotherapy and gene insertion. Electroporation might allow delivery of certain drugs or nanoparticles into the cell without strongly affecting the viability of the cells. Retention of the pores in the membrane wall, however, can lead to cell death (apoptosis).

If we have a pulsed electric field rising faster than 10 ns, the ions in the cytoplasm have insufficient time to migrate to the plasma membrane and the applied electric field is able to transit the plasma membrane and affect the intracellular structures. Electroporation can now occur at the subcellular membranes and we can manipulate intracellular structures. This can be used to kill cancer cells and insert gene-modified DNA [1,2].

A PROLATE-SPHEROIDAL IMPULSE RADIATING ANTENNA FOR NONINVASIVE CANCER TREATMENT

Research on nEPs is yielding promising results for cancer treatment and gene insertion [1-3]. However, in earlier studies the electric field was invasively delivered to the tumor using implanted electrodes and this treatment has some disadvantages, including discomfort. Current research has been initiated into using psIRAs to noninvasively deliver the sEP to the melanoma cells [5-9].

For sPE applications the dielectric properties of the tissue play a key role in determining the electric field distribution compared with the resistive characteristics of the media. First, for sEPs the conductance of the membranes are as-

Licence to err
You can break every grammatical and syntactical rule consciously when, and only when, you have rendered yourself incapable of breaking them unconsciously.

Bernard Levin

What counts
Throughout all written history the killing of people was never limited by the ability to kill people but always by the amount of intention to kill people.

Edward Teller

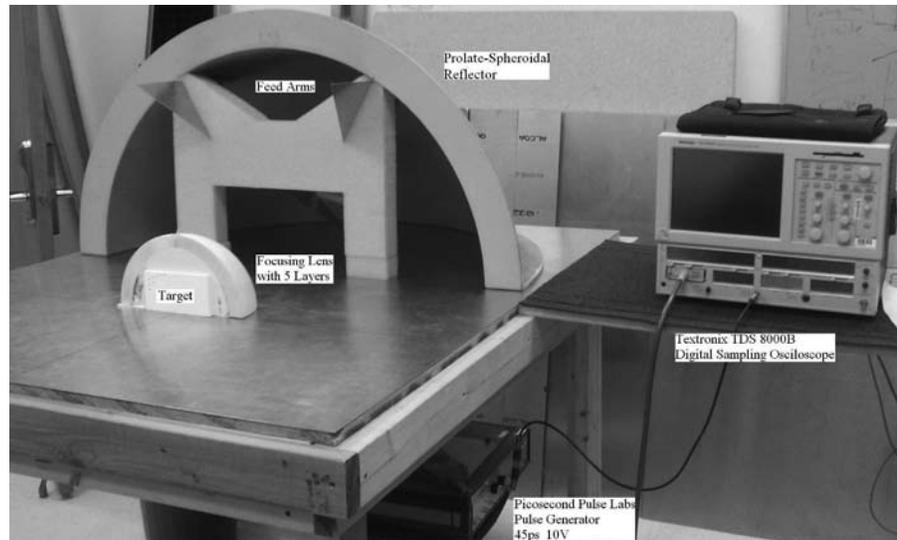


Figure 2. Experimental setup of psIRA and focusing lens geometry for cancer treatment

sumed to be zero and the capacitive components of cytoplasm and nucleoplasm are neglected. Second, subnanosecond regime is giving promising results for electric field-cell interactions. psIRAs may be able to induce apoptosis in tissue instead of needles [1,6].

Using electrodes embedded in the tissue limits the cancer treatment efficacy of the pulsed electric field since the tumor is close to the skin or surface of the body. psIRAs allow one to apply such electric fields to tissues more directly compared with using needles. The psIRA will also reduce the damage to the tissue layers surrounding the target and the skin. The spatial resolution of an electric field generated in tissue depends on the pulse duration and the permittivity of the tissue. Even though IRAs have been mainly designed for far-field applications, for bioelectric applications one needs to operate in the near-field.

A psIRA is used to launch an inhomoge-

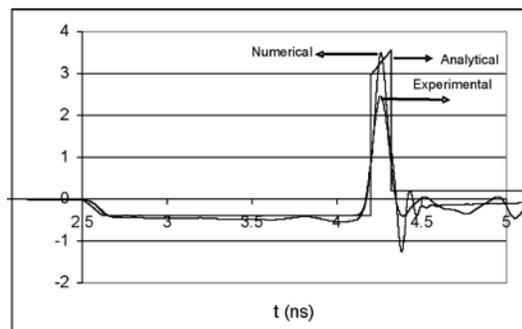


Figure 3. Analytical, numerical and experimental focal waveforms for two-arm psIRA without focusing lens.

neous plane wave from one focal point and reflect it toward a second focal point where the melanoma tissue is located. We choose a special case of the psIRA's geometric parameters (as in [6]) where the geometric parameters are $z_p = 0$, $b = \Psi_0 = .5m$, $a = .625m$, $z_0 = .375m$ (1) where z_p is the z-coordinate of the truncation plane, a and b are the two radii for the prolate-spheroid, and z_0 is the focal distance.

The experimental set-up that is being investigated and would be suitable for cancer treatment uses basically four components: a two feed arm psIRA, a sampling-oscilloscope, a pulse generator, and a focusing lens and target. (It should be noted that only a two feed arm is required in this proof-of-principle experiment since a conducting ground plane is used. In future actual experiments with patients a four feed arm full IRA will be used.) As seen in Fig. 2, we use a Tektronix TDS 8000B Digital Sampling-Oscilloscope with a Tektronix 80E04 sampling head to measure the waveform at the second focal point. In addition, we use a Picosecond Pulse Labs pulser with a PSQL 4050 RPH fast pulser head generator for pulse excitation. The output of the step generator is a 45-ps rise time with a 10 V amplitude.

We have investigated a new manifestation of an IRA in which we use a prolate spheroid as a reflector instead of a parabolic reflector and focus in the near-field region instead of the far-field region. This technique minimizes skin damage associated with inserting electrodes near the tumor. Analytical calculations, numerical simulations, and experimental data is used to find the focal waveform characteristics and spot sizes. Figure 3 presents analytical, numeri-

Layers	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
r (cm)	15	12	9.7	7.8	6.2	5	4	3.2	2.6	2.1
ϵ_r	1.6	2.4	3.7	5.8	9	14	21.7	33.6	52.2	81

Table 1. Radii and ϵ_r values for each layer in an optimized 10-layer graded permittivity dielectric focusing lens.

cal and experimental focal waveforms for a two arm psIRA without a focusing lens. This work has been completed and reported.

For our final experiments, we will be using a focusing lens at the second focal point of the psIRA. Our motivations for using a lens before the second focal point are to eliminate impedance mismatch between the dielectric constant of air and the dielectric constant of the target, $\epsilon_{r\text{target}}$ and to obtain better focusing. The lens

provides $\epsilon_{r\text{target}}^{1/4}$ times greater field amplitude and a $\epsilon_{r\text{target}}^{1/2}$ reduction in the spot size.

In order to eliminate the impedance mismatch between the target (which is typically close to the dielectric constant of water, $\epsilon_{r\text{water}} = 81$) we have designed a graded-permittivity dielectric lens. A lens design procedure, with constant wavelength-to-cross-section ratio as (dielectric constant) increases from unity to $\epsilon_{r\text{target}}$, is used to obtain better focusing at the second focal point of a psIRA. Our analytical calculations and numerical simulations show that the lens should comprise at least 10 layers and have a 15 cm radius to achieve the desired focusing [5]. (Table 1 presents the calculated radii and ϵ_r values for different adjacent 10 layers.)

For our initial experiments, however, in order to simplify construction, we have designed and fabricated a 5-layer lens and the relative dielectric constant of the 5th layer is $\epsilon_{r\text{target}} = 9$.

CONCLUSIONS

Subnanosecond pulsed electric fields are an exciting new development in the biomedical field for cancer treatment and gene therapy. sPEs may kill melanoma and allow for the insertion of new genes into living cells with the aim of correcting genetic defects. The invasive method of delivering these fields, through implantable electrodes, is a limiting factor with respect to practical applications. The noninvasive delivery technology using a psIRA that we described in this article may also be developed for application to target cells deep within the human body. Given the tightly focused wavebeam spot, this would also result in significantly reduced dam-

age to adjacent healthy tissue. This ongoing research project will speed the development and use of pulsed electric fields as a new medical therapy.

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Dilemma

The coexistence of an insatiable appetite for more knowledge and an intense suspicion of its further development is a paradox of Western culture today.

Frank Furedi

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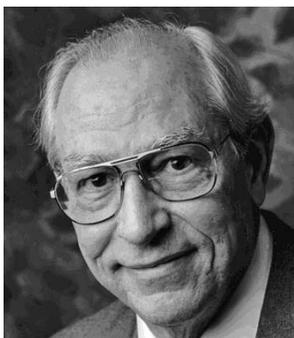
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OBITUARY

Robert N. Beck 1928-2008



Robert N. Beck
1928-2008

Robert N. Beck, pioneer in the development of the mathematical theory of radionuclide imaging and in the conceptualization of the field of imaging science, died August 6, 2008, from myelodysplasia, a form of leukemia. He was 80.

Bob Beck was born in San Angelo, TX, in 1928; served in the U.S. Navy from 1946 to 1948; and entered in 1948, at age 20, the Hutchins College of the University of Chicago. This entrance was the beginning of a direct and continuous affiliation with the University of Chicago that lasted 60 years.* In 2008, at the time of his death, Robert N. Beck was Professor Emeritus, Department of Radiology, the University of Chicago (UC).

Throughout his 50-year professional career, Beck made significant contributions to the fields of nuclear medicine, medical imaging, and imaging science. Some of those contributions follow.

In the 1950s, through adaptation of principles, concepts, and methods of the physical sciences, Beck and colleagues developed a statistical-criterion-based theory for determination of the optimum gamma-ray energies for specific imaging applications (1,4,8). Application of the theory was pursued in the early 1960s and resulted in the first uses and

the rapid acceptance of Tc-99m for clinical imaging—with the first protocols being some designed and executed for brain tumor detection (3). This work was conducted by Paul Harper, Katherine Lathrop, Don Charleston, and Bob Beck at the UC Argonne Cancer Research Hospital (ACRH). In the 1960s and 70s, Beck and colleagues also developed a theory of optimum collimator design for single-photon emission imaging (1,5); introduced Fourier methods designed to characterize the spatial resolution of radionuclide imaging systems and to account quantitatively for the effects of septal penetration and scattering on the contrast of emission images (4,5,8,9,10); and designed and built several imaging systems, including several animal imaging systems (2), a brain scanner (6), and the first whole-body scanner utilizing a scintillation camera rather than a rectilinear scanner.

In 1976, Beck was promoted from Associate Professor to Professor; and in 1977, Professor Beck was appointed Director of the Franklin McLean Memorial Research Institute (FMI, formerly ACRH). During the 1980s and 90s, Professor Beck and colleagues advanced their theoretical work on analysis of systems, advanced their foundational work on collimator design, and pursued development of application-specific imaging systems (14). They also

developed algorithms for retrospective superposition of brain images from positron emission tomography (PET) and magnetic resonance imaging (MRI) systems or PET and computed tomography (CT) systems (11) and developed PET-MRI methods for quantitative studies of drug effects on brain metabolism. In the late 1980s and early 1990s, Professor Beck pursued efforts to define and advance the field of imaging science (12,13,15) while Director Beck with others constructed the UC PET-VI and developed the UC FMI PET Center (with Nicholas J. Yasillo and Malcolm Cooper, MD), the UC Frank Center for Image Analysis (with Malcolm Cooper, MD, and Chin-Tu Chen, Ph.D.), the UC Maurice Goldblatt Center for Magnetic Resonance Imaging (with David N. Levin, MD, Ph.D.), and the UC-Argonne National Laboratory Center for Imaging Science (UC-ANL CIS) (with Albert V. Crewe, Ph.D.).

From 1960 to 1970, Robert N. Beck co-authored more than 25 published papers, on which he was lead or sole author of 15, and on which he was sole author of 9. In this period, he also co-edited, with Dr. Alexander Gottschalk, the book **Fundamental Problems in Scanning** (7); it was published in 1968 and was based on the content of a 1965 ACRH symposium of a similar name. The book and its material served as the foundation of education and research in radioisotope imaging theory and instrumentation for many years. Robert N. Beck's final CV, spanning 1960 to 2008, lists nearly 250 publications and significant presentations.

During his career, Beck received many awards including the 1996 IEEE Medical Imaging Scientist Award, the first given by the IEEE NPSS. Three of his awards and the associated citations reflect his contributions to imaging science, nuclear medicine, and medical imaging, respectively:

1991 Computer Smithsonian Nominee Award: For heroic achievement in information technology in recognition of your visionary use of information technology in the field of imaging science.

1991 Society of Nuclear Medicine Abersold Award: For outstanding achievement in basic science applied to nuclear medicine.

1996 IEEE Medical Imaging Scientist Award: For fundamental contributions to the mathematical and physical theories underlying nuclear medicine, medical imaging, and imaging science and for contributions to education and inspiration of generations of imaging scientists.

Bob is survived by his wife of 50 years Ariadne (Plumis) Beck of Indian Head Park, IL, and by two sisters Mary Ann Beck and Dorothy Corbell of San Angelo, TX.

* [AB, liberal arts, 1954; BS, mathematics and physics, 1955; Chief Scientist, Argonne Cancer Research Hospital (ACRH), 1957-67; Research Associate (Assistant Professor), 1964-67; Associate Professor, 1967-76; Professor, 1976-98; Director, Section of Radiological Sciences, Radiology, 1976-94; Director, The Franklin McLean Memorial Research Institute (FMI), 1977-94; Director, The University of Chicago-Argonne National Laboratory Center for Imaging Science (UC-ANL CIS), 1986-98; Professor Emeritus, 1998-2008]

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