

NPSS NEWS

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ELECTRONICS ENGINEERS



28th IEEE Symposium on Fusion Engineering SOFE 2019 Sawgrass Marriott Golf Resort and Spa Jacksonville, Florida, June 2nd–6th, 2019

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The 28th Symposium on Fusion Engineering (SOFE) will be held June 2nd–6th, 2019 near Jacksonville, Florida at the Sawgrass Marriott Golf Resort and Spa at Ponte Vedra Beach. The conference has an outstanding technical program addressing many aspects of nuclear fusion engineering research and technology development. It is sponsored by the IEEE Nuclear and Plasma Sciences Society and hosted at a world-class PGA Golf and beach resort on the east coast of the United States. This is the 28th conference spanning over 56 years of IEEE sponsorship. SOFE has evolved to an international conference with over 300 attendees and is complete with four days of parallel technical sessions, a vendor exhibition, and two minicourses.

Early registration is now open on the conference web site. The early registration deadline is April 15th, 2019. The abstract submission deadline was January 15th, 2019, and the remaining acceptance notifications were issued shortly after February 1st, 2019. The hotel room block at a reduced conference rate is available until May 6th, 2019. The number of rooms is limited, and participants are encouraged to book early.

The hotel is a short 51 km (~32 miles) drive southeast toward the coast from Jacksonville. Ponte Vedra Beach is synonymous with golf—although it offers many other allures. The PGA Tour and The Players Championship are played at TPC Sawgrass, home of the famous 17th-hole island green. But don't forget that the word "beach" is part of the name. Ponte Vedra Beach's 40-foot sand dunes are among the highest in Florida. From their peak,

they race down to white sand beaches made from Appalachian quartz and ancient coquina. Seaside resorts and private escapes can be found in the twisted oaks and hammocks of the wild palmettos. Miles of fresh-water streams, creeks and lagoons course through the natural area of Ponte Vedra Beach. Elegant shopping and fine dining are widely available. The average high temperature in June is 31° C with lows of 22° C. In addition to your golf clubs, bring your sun glasses and beachwear as well. And, don't forget your family. There's plenty for them to do, while you are enjoying this remarkable retreat into fusion engineering. Check out the Sawgrass Marriott website for more information. Links for the Marriott, travel and registration can be found on the conference website.

The technical program will emphasize the theme of the conference, which is The Future of Fusion—Transitioning to Energy Production. Presentations will be distributed among four plenary sessions, fourteen oral sessions and three poster sessions. Topics include Experimental Devices, Next-step Devices and Power Plants, MFE and IFE Alternate Concepts, Innovative and Disruptive Technologies, Diverters and High Heat Flux Components, Chambers, Blankets, and Shields, Fueling, Exhaust, and Vacuum Systems, IFE Fusion Studies and Technologies, Plasma-facing Materials and Surface Engineering, Diagnostics Engineering and Integration, Safety and Neutronics Materials, Heating and Current Drive, Disruption Mitigation and Control, Operation and Maintenance, Remote Handling and RAMI, Magnet Engineering, Power and



Dennis Youchison
General Chair

Control, Process Simulation and Plant Simulators, Systems Engineering and Large Scale Integration.

The plenary sessions will include presentations by the leaders of each of the ITER partners (China, the European Union, India, Japan, Korea, the Russian Federation, and the United States) as well as presentations by key persons from the ITER project site. ITER is the premiere fusion project in the world and will be the first large-scale fusion reactor. Other presentations will include the U.S. Department of Energy perspective and progress and status of demonstration reactor designs. These sessions will provide the context for an evening town hall meeting where various roadmaps or development plans for key power reactor technologies will be proposed and discussed.

All authors of SOFE-2019 presentations, whether oral or poster, will have the opportunity to publish their work in a special issue of IEEE

CONFERENCES Continued on **PAGE 2**

Conferences Continued from PAGE 1



Brad Nelson
Program Chair

Transactions on Plasma Science (TPS), a peer-reviewed journal. Submitted manuscripts will be reviewed anonymously by two or more peer reviewers and must meet the journal's normal standards to be accepted. Please see the publication policy on the conference website for more details.

The SOFE 2019 conference will include an exciting social program in which all conference attendees will be invited to participate. In addition to the opening reception (Sunday evening) and the conference banquet (Wednesday evening), SOFE 2019 attendees are encouraged to join the Women in Engineering luncheon on Monday, and the Young Professionals reception on Tuesday.



Ankita Jariwala
Events Chair

For the Women in Engineering luncheon, we have invited Dr. Valeria Riccardo (Head of Engineering, Princeton Plasma Physics Laboratory) as the speaker. She is the first female Head of Engineering at PPPL and has been in the fusion field for more than 20 years. A Question and Answer event with Dr. Riccardo is planned following her talk. We will also have a panel discussion to exchange ideas and provoke discussion within the community.



Daniel Andruczyk
Minicourse Chair

For the Young Professionals reception, experienced staff will share their instrumental experiences to inspire and encourage young professionals to continue in fusion engineering and research. Dr. Richard Nygren of Sandia National Labs will present his findings on the changing demographics of personnel in the US fusion program, and discuss new opportunities for young people and the importance of mentoring young staff.

A Town Hall meeting on the topic of "Accelerating the Development of Fusion Power" will follow immediately after the Young Professionals reception on Tuesday evening. We are pleased to have Dr. Dale Meade, retired from PPPL, lead the discussion on pathways to a pilot fusion power plant. We hope to foster input from the engineering community to a strategic planning exercise currently underway by APS for the Fusion Energy Science Advisory Committee. Input from and comparison to current plans in Europe, Japan and China are welcome.



Kevin Freudenberg
Exhibits Chair

The SOFE awards banquet will be held on Wednesday evening. Participants can enjoy dinner with colleagues involved in fusion from around the world. At this event we will thank four retiring Fusion Technology Standing Committee (FTC) members for their years of service, and the FTC chair will welcome

four newly elected committee members. Two Fusion Technology awards, those for 2018 and 2019, will be presented to recognize outstanding individual contributions to research and development in the field of Fusion Technology. Finalists in the SOFE2019 student paper competition will also be recognized, and a student award will be presented.

Two Short Courses will be held at SOFE 2019. Conference participants can take advantage of this opportunity to learn about emerging subfields of fusion engineering and science. If you are a student or someone who is switching to a new subfield within fusion and want to learn from the experts, then one of the offered mini courses is for you! The course instructors include leading researchers in the areas of experimental and computational plasma-material interactions and neutronics. The courses run in parallel and are IEEE certified as continuing education units with certificates being given to participants completing the short course.

One course is on Plasma Material Interactions (PMI). The aim of the mini course is to provide a comprehensive introduction to plasma-material interactions with an emphasis on fusion plasmas. This mini course will address rising interest in the area of plasma material interactions and will in part introduce the breadth and depth of the subject including: plasma surface interactions in fusion edge plasmas, plasma diagnostics for PMI and modeling of the plasma edge and materials, where the plasma/material interface plays a crucial role in materials performance and behavior. A unique aspect of this mini course is to bring instructors who not only have expertise in plasma-material interactions, but also extensive experience both in PMI experiments and atomistic/multiscale computational PMI modeling. The course will describe uniquely the challenges of PMI experiments and computational modeling and the areas in which these two thrusts can complement each other. Topics include: PMI fundamentals, the plasma sheath, plasma facing components, PMI diagnostics, computational PMI, PMI of the divertor, PMI of the SOL and pedestal. The course instructors include leading researchers in the areas of experimental and computational plasma-material interactions.

The other is a neutronics minicourse that provides a quick overview of the state-of-the-art nuclear assessment. It targets students and new researchers in the fusion field to bring them up to speed on the basics and pertinent topics over the course of one day. The nuclear assessment is an essential element for the success of any fusion device and has been used as a design tool at early stages of

all fusion designs, covering three closely related areas (neutronics, shielding, and activation) and calling for measures to enhance the physics and engineering aspects of each design. Such an integral assessment identifies the nuclear parameters and addresses key issues related to tritium breeding ratio (TBR), neutron wall loadings on first wall and divertor, selection of low-activation materials, radial/vertical build optimization and definition, magnet protection, shielding of vital components, survivability of structural materials in 14-MeV neutron environment, and handling of radioactive materials during operation and after decommissioning. This minicourse covers the basics of fusion neutronics, nuclear assessment approaches, latest design philosophy, and applications for ITER experimental facility, conceptual magnetic (tokamak/spherical tokamak/stellarator) and inertial fusion power plants as well as the next-step facilities before DEMO. High fidelity in nuclear results of such fusion devices mandates performing state-of-the-art nuclear analyses that have been achieved through coupling the computer-aided design (CAD) system with the three-dimensional neutronics codes to preserve all geometrically complex features of fusion systems. As such, CAD-based neutronics approaches and potential applications will be outlined in detail.

SOFE will also host a vendor exhibit for companies engaged in fusion technology. It will allow for one-on-one discussions between conference attendees and exhibitors on the latest developments in the scientific, technological and engineering issues of fusion energy research, facilities, and equipment. On Sunday evening, attendees and their companions are invited to a reception that showcases the vendor exhibits. Please drop by the vendor booths during the conference to learn about their latest innovations and contributions to the advancement of fusion. Being a conference exhibitor or sponsor is a tremendous way to expose your company to a broad spectrum of industrial, government, and university organizations and a way to further immediate and future business goals. Exhibitors also have the option of placing advertising in the program book and to have their logo displayed on signage throughout the conference venue. An IEEE membership table will provide information about IEEE and NPSS, the benefits of society membership, and offer six months of free membership to new applicants. For further information about the exhibit, booth sizes and locations, please visit <https://sofe2019.utk.edu/sponsors.html>.

Dennis Youchison, SOFE 2019
General Chair, can be reached by
E-mail at youchisondl@ornl.gov.

2019 IEEE Nuclear and Space Radiation Effects Conference



Teresa Farris
Publicity Vice-Chair

The 56th IEEE Nuclear and Space Radiation Effects Conference will be held July 8th–12th, 2019 at the Marriott Rivercenter Hotel, San Antonio, Texas. The General Chair is John Stone, Southwest Research Institute. The conference will feature a Technical Program consisting of ten 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 8th, a Radiation Effects Data Workshop, and an Industrial Exhibit.

SHORT COURSE

The Short Course Chair is Steven Moss, The Aerospace Corporation (retired). The theme of the 2019 course is *Predicting, Characterizing, and Mitigating SEE in Advanced Semiconductor Technologies*.

Presentations and speakers for the five sessions are:

Basics of Single Event Effect (SEE) Mechanisms and Predictions
Dr. Daisuke Kobayashi, ISAS/JAXA

SEE Testing With Broad and Focused Particle Beams
Dr. Arto Javanainen, University of Jyväskylä

Laser-Based Testing For SEE
Dr. Dale McMorrow, U.S. Naval Research Laboratory

The Current Status and Potential Of Pulsed X-Rays as a High-Resolution Probe for Single Event Effects Testing
Mr. Stephen LaLumondiere, The Aerospace Corporation

SEE Test and Analysis Of Complex Devices in Advanced Technologies: From Cells to Systems
Mr. Manuel Cabanas-Holmen, Boeing Research & Technology

TECHNICAL PROGRAM

The Technical Program Chair is Simone Gerardin, University of Padova. He and his technical committee will select contributed papers that describe the effects of space, terrestrial, or nuclear radiation on electronic and photonic devices, circuits, sensors, materials and systems, and semiconductor processing and design techniques for producing radiation-tolerant devices and integrated circuits.

The Poster Session Chair is Ethan Cannon, Boeing. The Data Workshop Chair is Kirby Kruckmeyer, Texas Instruments.

The Technical Program Session Chairs are:

Basic Mechanisms of Radiation Effects
Lili Ding, NINT

Dosimetry
Anatoly Rosenfeld, Wollongong University

Hardness Assurance
Tom Turflinger, Aerospace Corporation

NUCLEAR & PLASMA SCIENCES SOCIETY NEWS

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Hardening by Design

Jeff Kauppila, Vanderbilt University

Devices and ICs

Indranil Chatterjee, Airbus

Photonic Devices and ICs

Vincent Goiffon, ISAE-SUPAERO

Single-Event Effects: Mechanisms and Modeling

Rubén García Alía, CERN

Single-Event Effects: Transient Characterization

Zach Fleetwood, SpaceX

Single-Event Effects: Devices and ICs

Balaji Narasimham, Broadcom

Space and Terrestrial Environments

Giovanni Santin, ESA

LOCAL ARRANGEMENTS

The Local Arrangements Chair is Brian Sierawski, Vanderbilt University. The conference social will be held on Wednesday, July 10th, a Tex-Mex buffet at the nearby Buckhorn Museum. Companion events

include a tour of the Spanish Missions and a guided riverboat tour followed by an exploration of the Pearl District and the Witte Museum.

For further information, check the conference web site <http://www.nsrec.com/> or Teresa Farris, Vice Chair, [Publicity at Teresa.farris@cobham.com](mailto:Publicity@Teresa.farris@cobham.com).

Conference Report

2018 IEEE NSS MIC

The 2018 IEEE NSS MIC Nuclear Science Symposium (NSS) and Medical Imaging Conference (MIC) was held at the International Convention Centre Sydney, in Sydney, Australia, from the 10th to 17th of November.

The recently built International Convention Centre (ICC) on beautiful Darling Harbour comfortably accommodated more than 1800 delegates and accompanying persons from more than 50 countries and provided a quiet atmosphere; furthermore, the convenient Darling Harbour lecture room for plenary sessions and many other rooms for about five to six parallel sessions closely located to each other and to the Industrial Exhibition area and poster session provided excellent meeting space. A lot of quiet space for casual meetings inside of the ICC spacious atria and just outside, where many cosmopolitan cafes were available, allowed many opportunities for productive discussions while sipping a cup of aromatic real coffee and enjoying the Darling Harbour view.

Thanks to our industrial sponsors and the New South Wales Government, we were able to support

188 students and young researchers to attend nine short courses, six Workshops and the conference.

The Conference’s success was made possible by the incredible work of the Organizing Committee members who contributed a massive effort both before and during the meeting to ensure that everything worked as planned. The Program Chairs, topic conveners and session chairs assembled a strong program with the help of many reviewers. The scientific program was outstanding with more than 90 oral sessions and 873 poster presentations. The Women in Engineering (WIE) lunch was a great success and attended by more than 100 scientists and engineers, (not just women) and encouraged an open discussion on “unconscious bias.”

A special feature of the conference was a well-organized social program which offered to the delegates a variety of tours allowing them to enjoy picturesque Sydney from both land and water.

Holding this conference in Sydney has demonstrated that IEEE Region 10 - Asia Pacific - is a sophisticated academic and high-tech industry hub contributing strongly to NPSS activities. It was reflected in 1,615 delegates and 55 companies presenting at the

industrial exhibition from Japan and China including new companies from Asia which had never attended previously. It is no doubt that 2021 IEEE NSS MIC in Yokohama, Japan will be another outstanding Asian Pacific gathering of experts in radiation detection science and its applications.

It is the attendees of the Conference that deserve the most thanks, as it is their work that makes all of this possible. Some of the presented talks or posters are already available to download online as well some pictures for your memories to be find on the conference website The Conference Record is now being finalized and will be ready for you to find in IEEE XPLORE, the digital library from IEEE, in the summer of 2019.

We hope to bring our Australian experience to Manchester in 2019 to make the conference as great a success as this 2018 conference in Sydney was.

Best regards,
Anatoly Rozenfeld
General Chair

Ralf Engels
Deputy General Chair

Email: nssmic2018@ieee.org



Anatoly Rozenfeld
General Chair



Ralf Engels
Deputy General Chair

President’s Report



Ron Schrimpf
IEEE NPSS President

This column marks my first as president of NPSS, as I begin a two-year term (2019-2020). There are many exciting things taking place in NPSS and I hope that each of you finds a way to get involved. My own experience with NPSS began in 1987 when I first attended the Nuclear and Space Radiation Effects Conference, one of the numerous conferences sponsored or co-sponsored by NPSS. Little did I know at that time that my involvement with NPSS would become a cornerstone of my career. The technical information I have received from attending NPSS conferences and reading NPSS journals has been essential to my own research and that of the Institute for Space and Defense Electronics at Vanderbilt University, where I work. The network of colleagues and friends I have developed through NPSS has given me a ready source of collaborators and people with whom I can discuss technical questions. My involvement in leadership positions in NPSS has been particularly rewarding. I hope that each of you is able to participate as well, whether it is through publishing, reviewing, attending conferences, or serving in a volunteer capacity.

As I begin my service as president, the NPSS is in excellent shape owing to the contributions of numerous volunteers. I am particularly thankful to my predecessor, Stefan Ritt, who moves into the role of past president. I have learned a lot from

Stefan and he has accomplished a lot, including preparation of very useful information documenting the operation of NPSS. I also thank our past two Presidents Janet Barth and John Verboncoeur, our secretary Albe Larsen, our treasurer Ralf Engels (assisted by Ron Keyser), and our committee chairs Steven Gold (Chapters), Peter Clout (Communications), Susanne Kuehn (Conferences), Dan Fleetwood (Distinguished Lectures), Ned Sauthoff (Fellows), Harold Flescher (Finances), Sal Portillo (Membership), Jean-Luc Leray (Membership, Europe), Bruce Mellado (Membership, Africa), Heiko Koerte (Membership, Industry), Paul Dressendorfer (Publications), Christian Bohm (Transnational), and Christoph Ilgner (Young Professionals). I learned a lot from them during my time as vice-president and I look forward to working with them in the future. I also look forward to working with Steve Meikle from the University of Sydney, who assumes the role of vice-president.

NPSS is organized into eight technical committees, which are the core of the Society. Each of these TCs organizes one or more conferences. I encourage you to identify the TC that aligns most closely with your interests and to get involved. The TCs are each led by a chairperson who serves as a point of contact and organizes activities in that area. These TCs and the chairpersons for the coming year are Computer Applications in Nuclear & Plasma Sciences: Martin Grossmann; Fusion Technology: Charles Neumeyer; Nuclear Medical and Imaging Sciences: Jae Sung Lee; Particle Accelerator Science and Technology: Kathy Harkay; Plasma Science and Applications: Joe Schumer; Pulsed Power Science and Technology: Susan Heidger; Radiation Effects: Janet Barth; Radiation Instrumentation: Chiara Guazzoni. I look forward to working with this outstanding group.

NPSS has a very robust publication enterprise. Since you are reading this article, you already know about the NPSS Newsletter, which is edited by Albe Larsen.

We have an excellent website, which is overseen by Dick Kouzes. Please check it out at ieee-npss.org. Martin Purschke manages our social media presence; follow us on Facebook. We have four journals that we are wholly or partially responsible for: *Transactions on Nuclear Science* (edited by Paul Dressendorfer, with Zane Bell assuming the editor’s mantle now), *Transactions on Plasma Science* (edited by Steve Gitomer), *Transactions on Medical Imaging* (edited by Michael Insana), and *Transactions on Radiation and Plasma Medical Sciences* (edited by Dimitris Visvikis). The last of these journals, TRPMS, is relatively new and is intended to handle all of the medically-related papers that were formerly published in TNS and TPS with one goal of achieving recognition in the medical papers indices.

There is a movement in technical publishing toward “open access,” a model in which published papers are freely available on-line without a subscription. In this case, the funding organizations associated with

the authors’ work may pay the costs of publishing upfront. The IEEE currently offers open access options and is exploring additional changes in its publishing model. NPSS is closely monitoring these changes, which may affect our own publications. We will keep you informed as the situation evolves.

I offer my thanks to all NPSS volunteers and members for their contributions to our community. I look forward to interacting with many of you and welcome your feedback.

Sincerely,

Ron Schrimpf, IEEE NPSS President, can be reached by E-mail at ron.schrimpf@vanderbilt.edu

SOCIETY GENERAL BUSINESS
Continued on PAGE 4

LONG-RANGE ATTRACTION

We sleep in separate bedrooms, we have dinner apart, we take separate vacations – we’re doing everything to keep our marriage together.

Rodney Dangerfield

BUFF(ET) DINNER

I feel like a mosquito in a nudist colony. I know what to do; I just don’t know where to start.

Pat Riley

STILL WORKING ON IT

Man is the only animal for whom his own existence is a problem which he has to solve.

Erich Fromm

HIGH JINX

The fourth floor has been moved to the ninth floor.

Sign in an Olympia, WA hospital elevator

YOU’RE EXCUSED

Old age is when you first realize other people’s faults are no worse than your own.

Edgar A. Shoaff

Secretary's Report



Albe Larsen
IEEE NPSS Secretary and Newsletter Editor

AdCom met on November 10th in Sydney, Australia, at the Sydney International Conference Centre, following the 2018 IEEE NSS/MIC. Finance Committee and Communications Committee meetings were held on November 9th, and the Transnational Committee met on November 8th, during the conferences. Sydney provided us an outstanding venue for our meetings.

Ralf Engels, our Treasurer, noted that conference closings are going better with all 2017 conferences closed or in audit. Overall, 2017 conferences closed in the black but with lower-than-budget returns. Society net worth at the end of September is down ~ a half-million dollars over 2017. Ralf reviewed the budgeting process and reiterated that conferences must submit budgets two to three months before any money is actually needed. For conferences where venue deposits or payments are required, this may be several years before the conference is to be held! Budgets are reviewed by a team comprised of the Finance Committee Chair, the NPSS Vice President, and the NPSS Treasurer plus the Technical Committee Chair responsible for that conference. Conferences are required to use our web budgeting tool. Many new features will make the tool easier to use including use of several international currencies for conferences held outside the U.S., the ability to add or remove line items, a facilitated import/export to Excel feature, and others. A list of proposed 2019 Initiatives was also presented including funding for Instrumentation Schools, for the budget tool upgrades, for conference abstract software and for humanitarian activities.

Stefan Ritt, our President, announced the election results for new AdCom members: Adam Alessio (NMISC), Anna Grasselino (PAST); Keith Avery (RE) and Sara Pozzi (RI). We welcome them and thank those whom they have replaced for their service. We also have a number of new Technical Committee Chairs: Janet Barth (RE), Kathy Harkay (PAST), Joe Schumer (PSAC) and of course a new President and

Vice President/President-elect. See below for brief biographies of these new members.

Our Society Review, a five-year event, will be held February 14th. It was preceded by a Conference Portfolio Review where we did well. We have also added a number of Student Branch Chapters, and a number of new awards were approved at the November TAB meeting, including three best paper awards, one for each of our principal journals, TNS, TPS and TRPMS.

NPSS's 50th Anniversary will be in 2022. How would you, our membership, like to see this celebrated? Send your ideas to me or to our 2019-2020 President, Ron Schrimpf (ron.schrimpf@vanderbilt.edu). Also look at microvolunteering as a way to contribute. See the IEEE Young Professionals web site. In NPSS at our NSS MIC conference, the CIP – Conference Information and Promotion committee – provides one such opportunity.

Creation of a Fellow Search committee is being discussed as is the inclusion of the ANIMMA conference in our portfolio and the possible creation of a new Technical Committee. For our publications, Open Access is a major issue and will be discussed further. Our journals are hybrid Open Access, but NPSS may need a full Open Access journal. Stefan also led the creation of an NPSS Policies and Operations manual to supplement our Constitution and Bylaws.

John Verboncoeur, our new Division IV Director and member of the TAB Management Committee, reported on the Atlanta TAB Management Committee meeting held in Atlanta on 30 Sep 2018. Key issues included:

- » the inability of Division 1 to nominate a slate for Division 1 Director, so TAB N&A will solicit nominations and vet a slate. TAB Assembly will elect the Director from the vetted slate.
- » Certain funding agencies, primarily within the EU, are proposing that the groups which they support publish only in fully open access journals beginning in 2020. IEEE Publications is exploring various options for providing appropriate venues for affected authors.
- » An ad hoc committee has been established to look at ways to improve contracting in IEEE.
- » 2017 TAB revenues and expenses were reviewed. Revenue (63%) comes mainly from conferences

and periodicals (31%) while 31% of expenses go toward administration and committees/other.

» Another ad hoc committee will look at the Election Oversight Committee proposed changes, which seem to defy transparency and open expression of opinion.

» A proposal has been made to limit the term of Society and Council presidents to two years over a lifetime.

Our Technical Committees are doing well. See TECHNICAL COMMITTEE, FUNCTIONAL COMMITTEE and LIAISON reports which follow this section.

ADCOM ACTIONS

- » It was moved by NMISC and passed that AdCom approve the technical co-sponsorship of 8th Conference on PET/MR and SPECT/MR (PSMR 2019) in Munich, Germany. NPS will pay the MCE fee and papers will be published in TRPMS.
- » It was moved, seconded and passed that AdCom approve changing the prizes for the Glenn F. Knoll Postdoctoral Education Grant and the Glenn F. Knoll Graduate Education Grant to the following: Prize: \$5000 check, plaque and a copy of Glenn Knoll's textbook. Multiple recipients are not allowed.
- » It was moved, seconded and passed that AdCom approves the technical co-sponsorship of ICALEPCS 2019 with NPSS paying the TCS fee of \$1,000.
- » The Operations Review Ad Hoc Committee moves that AdCom approves that the proposed dates and locations of future AdCom meetings shall be placed on the meeting agenda for formal approval at least three regular meetings prior to the first of the meetings under consideration. Passed.
- » Motions from the Finance Committee with Recommendation for Approval
 - That AdCom approves the request for \$55K for the bending bamboo project in Vietnam for STEAM curriculum development, global classroom extension, classroom equipment and first electricity pilot planning in the Mekong delta. Passed.
 - That AdCom approve the The NPSS Budget Tool Initiative for the \$168.8k allocated. Passed.
 - That AdCom approve the NPSS Instrumentation School Initiative at \$20k (\$25k initially allocated). Passed.

- That AdCom approve maintaining dues at \$35 for 2020. Passed.
- That AdCom approve \$5k for a TRPMS website and marketing. Passed.
- That AdCom approve contributing \$5k/year for another 5 years to the Coalition for Plasma Sciences.
- FinCom recommends AdCom approve the "Process for Obtaining Early Conference Funds" and incorporating it in the Conferences part of the Policies and Operations Manual
- Process for Obtaining Early Conference Funds: Passed.
 - If conference committee not yet appointed, TC Chair appoints Acting Conference Treasurer
 - FinCom recommends selecting a previous conference treasurer as Acting Treasurer
 - Acting or Conference Treasurer determines up-front funding requirements and asks NPSS Treasurer to get CB account with funds in the name of the Conference
 - These funds will be carried in the conference budget as a loan from NPSS
 - NPSS Treasurer asks MCE to open CB account and issue checks
 - Signature cards signed by Conference Treasurer (or Acting) and TC Chair
 - ERs associated with early activities initialed by Conf Treasurer (or Acting) and submitted to NPSS Treasurer for processing.

AdCom concluded its meeting with the announcement that Ron Schrimpf was uncontested in transition from VP/President-elect, and that Steve Meikle was elected as our new VP/President-elect. Congratulations to both of them! See below for their brief biographies and goals, as well as biographies of our new AdCom members.

The next AdCom meeting will be held in Nashville, TN on March 9, 2019 preceded by a retreat.

Albe Larsen, IEEE NPSS Secretary and Newsletter Editor, can be reached by E-mail at a.m.larsen@ieee.org.

New AdCom Officers & Members



Dr. Ronald D. Schrimpf
IEEE NPSS President

Ron Schrimpf received B.E.E. (1981), M.S.E.E. (1984), and Ph.D. (1986) degrees in electrical engineering from the University of Minnesota. He was a faculty member at the University of Arizona from 1986-1996. Ron has been at Vanderbilt University since 1996, where he serves as the Orrin Henry Ingram Professor of Engineering and Director of the Institute for Space and Defense Electronics. ISDE translates the basic research conducted as part of Vanderbilt's Radiation Effects and Reliability Group to meet the needs of government and

industry. Ron has been involved with IEEE NPSS, particularly through the NSREC, since 1987. For NSREC, he served as General Chair, Technical Chair, Awards Chair, Short Course Chair, Short Course Speaker, Session Chair, and Guest Editor of the IEEE *Transactions on Nuclear Science*. He also served as a Member of the IEEE Fellows Committee, Chairman of the Radiation Effects Steering Group, Elected Member of IEEE NPSS AdCom, and IEEE Liaison with RADECS, the European radiation effects conference. At Vanderbilt, Ron has received the Chancellor's Cup, the Harvey Branscomb Distinguished Professorship Award, the School of Engineering Outstanding Teaching Award, and the Chancellor's Award for Research. Ron received the NPSS Early Achievement Award in 1996 and was elected a Fellow of the IEEE in 2000. He has received six Outstanding Paper Awards at NSREC and two at RADECS. Ron was an Invited Professor at the Université Montpellier II, France, in 2000. He has published over 500 papers in refereed journals, with many of these appearing in

the IEEE *Transactions on Nuclear Science*. Ron and his wife, Kathy, live in Nashville, TN.

Ron Schrimpf can be reached by E-mail at ron.schrimpf@vanderbilt.edu.



Steven M. Meikle
IEEE NPSS Vice President
President-elect

Steve Meikle (M'96-SM-'00) is a Professor of Medical Imaging Physics at the University of Sydney and Head of the Imaging Physics Laboratory at the Brain and Mind Centre (BMC). He received his Ph.D. from the University of New South Wales in

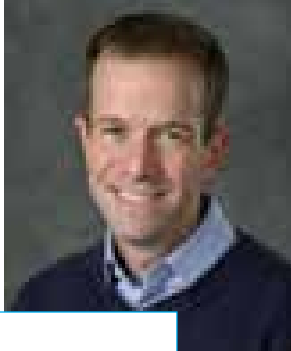
1995. He was a medical physicist at Royal Prince Alfred Hospital in Sydney from 1987-2004, a visiting research associate at the Division of Nuclear Medicine and Biophysics, UCLA School of Medicine from 1991-2 and a postdoctoral research scientist at the MRC Cyclotron Unit in London from 1995-6, before joining the University of Sydney in 2004. He is best known for his contributions to the development of quantitative emission computed tomography and small animal molecular imaging. He has published nine book chapters and more than 200 research papers which have attracted over 5,500 citations (h-index 41). He has served on the Nuclear Medical and Imaging Sciences Council (2004-9) and as an elected NMISC representative on the Administrative Committee of NPSS (2015-18), and is currently Vice President of NPSS. He has organized IEEE short courses and workshops, was Deputy General Chair of the 2013 Nuclear Science Symposium and Medical Imaging Conference and Co-Chair of the 2018 MIC. He is a Senior Member of the IEEE, a Fellow of the Australian Institute of Physics and an Editorial Board member of the journal *Physics in Medicine and Biology*.

As Vice President of NPSS, my aim is to ensure the continued financial and scientific success of

our conferences and journals and build on recent initiatives that support women in engineering and young professionals across our diverse technical areas. I am also interested in exploring new models of membership that deliver enhanced value for money and attract new members. I look forward to serving the scientific community that has supported me throughout my career.

Steve Meikle can be reached by E-mail at steven.meikle@sydney.edu.au.

NEWLY ELECTED ADCOM MEMBERS



Adam Alessio
NMISC

Adam Alessio is a professor in the departments of Computational Mathematics, Science, and Engineering (CMSE), Biomedical Engineering (BME), and Radiology at Michigan State University. His research is focused on noninvasive quantification of disease through advanced imaging algorithms and integrated data analysis. Dr. Alessio's research group solves clinically motivated research problems at the intersection of imaging and medical decision-making. Current efforts center on translational medical research projects for topics including machine learning for quantitative diagnostics, cardiac perfusion estimation, quantitative PET and CT imaging, radiation dose optimization, and system modeling. Prior joining MSU, Dr. Alessio was a professor of Radiology at the University of Washington. He received his Ph.D. in Electrical Engineering at the University of Notre Dame and postdoctoral training in nuclear medicine physics at the University of Washington. He is the author of over 70 peer-reviewed publications, holds six patents, and has grant funding from the National Institutes of Health and the medical imaging industry to advance noninvasive cardiac and cancer imaging. Details can be found at <https://www.egr.msu.edu/~alessio/>.

Adam Alessio can be reached by E-mail at alessio@msu.edu.



Keith Avery
Elected AdCom Member, RE

Keith Avery is a principal engineer for the Air Force Research Laboratory, Space Vehicles Directorate, Battlespace Environment Division (AFRL/RVB) at Kirtland AFB, NM. In this role he provides Directorate-wide support for radiation effects on electronics, technology development efforts and works across the Directorate to develop advanced technology demonstrations for future Air Force missions. Mr. Avery previously led the Space Electronics Technology program at AFRL which focused on the development of electronic technologies necessary to support the evolving needs of the next generation AF satellite programs. He received his B.S. degree from DeVry Institute of Technology in 1983. For the first 12 years of his career he worked in the commercial sector designing digital and analog circuits for commercial, industrial, and telephony applications. Prior to joining AFRL he worked as a government contractor performing design activities for space experiments, advanced packaging techniques, and radiation effects on micro-electronics. He has

authored or co-authored numerous papers on designs for space and radiation effects. Mr. Avery is a member of IEEE and senior member of AIAA.

Keith Avery can be reached by E-mail at keith.avery.2@us.af.mil.



Anna Grassellino
PAST AdCom Member

Anna Grassellino is a Senior Scientist at the Fermi National Accelerator Laboratory (FNAL) and the Deputy Head of the Applied Physics and Superconducting Technology Division, where she oversees the Superconducting RF (SRF), Magnet and Cryogenic Sectors. She is also Co-Director of the FNAL- Northwestern University Center for Applied Physics and Superconducting Technologies, and Adjunct Professor of Physics at Northwestern University.

Anna's research focuses on pushing the performance of SRF cavities towards higher quality factors and higher accelerating fields, via manipulation and understanding of nanometer-scale changes at the cavity surface. She has pioneered nitrogen doping of SRF cavities which has tripled their quality factors compared with the previous state of the art and is now implemented in the LCLS-2 accelerator.

Anna received her B.S. and MD in Electronic Engineering in 2005 from the University of Pisa, Italy and completed her Ph. D. in Physics at the University of Pennsylvania, U.S. in 2011. Her thesis work, carried out at TRIUMF (Canada), involved SRF cavity performance studies and the investigation of magnetic vortex penetration in niobium via muon spin rotation. Anna then became a postdoc at Fermilab, then Peoples Fellow, then Scientist.

Anna is the recipient of several awards for her research: DOE Early Career Grant, IEEE PAST Award, USPAS Prize, EPS-AG Frank Sacherer Prize, Presidential Early Career Award for Scientists and Engineers (PECASE) and several others.

Anna Grassellino can be reached by E-mail at annag@fnal.gov.



Sara Pozzi
Elected AdCom Member, RI

Sara Pozzi earned her M.S. and Ph.D. in nuclear engineering at the Polytechnic of Milan, Italy in 1997 and 2001, respectively. She is a Professor of Nuclear Engineering and Radiological Sciences and a Professor of Physics at the University of Michigan (UM). Her research interests include the development of new methods for nuclear materials detection, identification, and characterization for nuclear nonproliferation, safeguards, and national security programs. She is the founding Director of the Consortium for Verification Technology (CVT), a large consortium of 12 universities and nine national laboratories working together to develop new technologies needed for nuclear treaty verification. In this capacity, she directs the work of 25 faculty members and over 250 students engaged in research projects within the CVT. Professor Pozzi is the co-author of the Monte Carlo code MCNPX-PoliMi, which is being used at over 50 institutions

world-wide. Her publication record includes over 400 papers in journals and international conference proceedings. She was invited to give over 80 seminars, both nationally and internationally. She has graduated 21 Ph.D. students who have gone on to develop successful careers at the national laboratories, academia, and industry.

In 2018, Professor Pozzi was named the inaugural Director of Diversity, Equity, and Inclusion (DEI) for the UM College of Engineering. In this capacity, she heads the DEI implementation committee and works to ensure that the students, faculty, and staff are increasingly diverse, everyone is treated equally, and everyone feels included. She is the recipient of many awards, including the 2006 Oak Ridge National Laboratory Early Career Award, 2006 Department of Energy, Office of Science, Outstanding Mentor Award, 2012 INMM Edway R. Johnson Meritorious Service Award, 2012 UM Nuclear Engineering and Radiological Sciences Department, Outstanding Achievement Award, 2017 IEEE Distinguished Lecturer, 2018 Rackham Distinguished Graduate Mentoring Award. She is a Fellow of the American Nuclear Society and a Fellow of the Institute of Nuclear Materials Management.

Sara Pozzi can be reached by E-mail at pozzi@umich.edu.

NEW TECHNICAL COMMITTEE CHAIRS



Janet Barth
Chair, RE Steering Group

Janet L. Barth is retired from NASA's Goddard Space Flight Center (GSFC). At her retirement she served as the Chief of the Electrical Engineering Division (EED) at GSFC where she was responsible for the delivery of spacecraft and instrument avionics to several of NASA's science missions, including, the Solar Dynamics Observatory, the SWIFT Burst Alert Telescope, the Lunar Reconnaissance Orbiter, the Global Precipitation Measurement mission, the Magnetospheric Multiscale Mission, and the James Webb Space Telescope. She also oversaw development of microwave and optical communications systems and suborbital avionics systems at the Wallops Flight Facility. She was a member of the team that developed NASA's systems engineering approach to radiation hardness assurance for emerging technologies. Starting in 1999, she worked on the development of NASA's Living With a Star (LWS) Program as a member of the science preformulation/proposal team and the LWS Program Science Architecture Team. In 2001 she was selected as the Project Manager for the LWS's Space Environment Testbed and from 2002 to 2008, she was a branch manager in the EED.

Barth is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), was the President of IEEE's Nuclear and Plasma Sciences Society (NPSS) from 2013-2014, and currently chairs the Society's Radiation Effects Steering Group. In 2014 she was presented with the IEEE/NPSS Radiation Effects Award. She is actively involved with the IEEE Nuclear and Radiation Effects Conference (NSREC); teaching the Short Course in 1997 and serving as the Guest Editor of the IEEE *Transactions on Nuclear Science* from 1998-2000, the Technical Program Chairwoman in 2001, and the General Conference Chairwoman in 2006. She is a regular participant in the European Radiation and its Effects on Components and Systems (RADECS) Conference and is an IEEE NPSS Distinguished Lecturer.

Janet Barth can be reached by E-mail at jbarth@ieee.org.



Chiara Guazzoni
Chair, RISC

Chiara Guazzoni, born in Milan, Italy on December 6, 1972, is Associate Professor of Electronics (since 2009) with tenure (since 2012) at Politecnico di Milano. She graduated cum laude in Physics in 1996 from the Università degli Studi, Milan, Italy. In 1996 she attained a Master's in Nuclear Physics at the same university and in 2000 she obtained the Ph.D. in Electronics and Communications Engineering at the Politecnico di Milano.

Since May 2008 she has been an Associate Technological Researcher at the Istituto Nazionale di Fisica Nucleare (INFN) with which she has been associated since 1995. She is a Senior Member of IEEE and a Member of the Italian Physical Society (SIF).

In 2014–2015 she took a 5-month maternity leave due to the birth of her daughter.

She won the 1999 IEEE NPSS Graduate Student Award. In 2001 she was awarded for her brilliant scientific activity by SIF. In 2004 she received the 2004 IEEE NPSS Radiation Instrumentation Early Career Award, for "contributions to an innovative X-ray spectroscopic imager with fast frame rates and nuclear electronics."

She was elected Member-at-Large of the Radiation Instrumentation Steering Committee (RISC) of the IEEE Nuclear and Plasma Sciences Society for the term 2014-2016, Vice-Chair for the term 2017-2018 and beginning in January 2019 she serves as Chair of RISC. She was appointed Chair of the RISC Awards Subcommittee for 2016, 2017 and 2018. She was elected Vice-Chair of the Italian Chapter of the NPSS for the term 2016-2018 and 2018-2020. She served as Deputy Program Chair for the 2015 IEEE Nuclear Science Symposium (NSS), San Diego (California) Oct. 31st – Nov. 7th, 2015 and as a Topic Convener for the IEEE NSS in 2014, 2017 and 2018.

Since 1994 Chiara Guazzoni has carried out her research activity in the field of Radiation Detectors and Frontend and Backend Electronics.

Chiara Guazzoni can be reached by E-mail at Chiara.Guazzoni@mi.infn.it.



Katherine Harkay
Kathy Harkay, Chair, PAST

Dr. Katherine Harkay received a Ph.D. in accelerator physics from Purdue University in 1993. She then joined the Advanced Photon Source (APS) at Argonne and served as Accelerator Physics Group Leader from 2003-2008. She presently serves as the Machine Manager for the two circular electron-beam injectors for the APS, and is the Level 3 Manager for Injectors for the APS Upgrade. In the latter role, she leads a team of physicists and engineers responsible for improving the high-charge performance of the existing APS injectors. In prior roles, she led the successful commissioning of two superconducting undulators at the APS. She is

AdCom Continued from PAGE 5

an expert in the study of electron cloud effects in high-energy storage rings. Other research interests include beam intensity limits, collective instabilities, and photocathode R&D for ultra-bright electron sources for next-generation X-ray sources. She holds two patents.

Dr. Harkay serves on the Australian Synchrotron Machine Advisory Group. In the past, she has served on scientific program advisory committees for the Brookhaven National Laboratory Accelerator Test Facility, SLAC Accelerator Research and Experiments, and the APS-IEEE U.S. Particle Accelerator Conference. She has chaired the Fermilab Accelerator Advisory Committee (2010-12) and the APS Division of Beams Ph.D. Dissertation Award Selection Committee (2010). She has advised five students over the past 10 years on accelerator research projects at Argonne and graduated a Ph.D. student.

Dr. Harkay joined IEEE-NPSS PAST in 2007 and was named IEEE Senior Member in 2014. In 2013, she was named Fellow of the American Physical Society, and in 2009 she received an Outstanding Alumnae award from Purdue University.

Katherine Harkay can be reached by E-mail at harkay@anl.gov.



Joseph Schumer
Chair, PSAT

Dr. Joseph W. Schumer is Branch Head and a senior research physicist in the Pulsed Power Physics Branch, Plasma Physics Division of the U.S. Naval Research Laboratory (NRL) in Washington, DC, primarily involved in the research areas of plasma physics and nuclear science. He received degrees in Nuclear Engineering from the University of Missouri-Rolla (B.S. 1992) and University of Michigan (M.S. 1994 and Ph.D. 1997). Since coming to NRL in 1997, he has earned a reputation as being an expert computational physicist by analytically and computationally modeling plasmas, vacuum and plasma-filled diodes, plasma-wave interactions in microwave structures, and charged particle beams using magnetohydrodynamic, kinetic (Vlasov-Maxwell and particle-in-cell), and Monte-Carlo methods. As Branch Head, he leads experimental and theoretical efforts over a wide area of pulsed power applications including: the development of high-power nuclear weapons effects simulators (NWES) and radiation sources for the US, UK, and France; the design of pulsed power systems and charged particle beam diodes for the Department of Energy (DOE); validating advanced computational

models of "System Generated Electromagnetic Pulse" using small-scale laboratory experiments; development of compact pulsed power to drive microwave sources for DoD projects; development of the electromagnetic railgun; intense pulsed active detection methods for DoD and the UK Ministry of Defence; the study of accelerated decay of radioisotopes as "advanced energetic materials." In recognition for support of DOE Stockpile Based Stewardship research, he was the co-recipient of three DOE Defense Program Awards of Excellence (2002, 2004, 2017) and three NRL Alan Berman Research Publication Awards (2001, 2006, 2012). He is a senior member of IEEE, Chair of NPSS Plasma Science and Applications Committee, General Chair of the IEEE ICOPS-Beams 2014 conference, and a member of various senior DOE Advisory Boards for stockpile stewardship and radiation sciences.

Joseph Schumer can be reached by E-mail at joseph.schumer@nrl.navy.mil

Technical Committees

COMPUTER APPLICATIONS IN NUCLEAR AND PLASMA SCIENCES



Martin Grossmann
CANPS Chair

Our committee has been working on options for the Real Time Conference 2020 in Vietnam. At a web meeting last December we decided for the ICISE conference center in the coasts town of Quy Nhon. Although this means that international participants have to take a one-hour domestic flight to reach Quy Nhon from Ho Chi Minh City

we found that ICISE provides a meeting place and infrastructure which better fits our Real Time conference requirements compared to other alternatives. Not staying in a big city, such as Ho Chi Minh City, will allow for much closer interaction among the participants which is what we want to achieve at our conference. We are now going ahead with the detailed planning. The date for Real Time 2020 has been fixed as April 13th – 17th, 2020 with a preconference workshop on April 12th

In this newsletter issue we continue the small series of articles by the winners of the 2018 CANPS Student Paper Award. Nico Giangiacomi from University and INFN Bologna, Italy, reports about first results with the general purpose readout board π LUP.

Martin Grossmann, Chair of the CANPS Committee, can be reached by E-mail at martin.grossmann@psi.ch.

FUSION TECHNOLOGY



Charles Neumeyer
FTC Chair

Now that the Fusion Technology Committee (FTC) has transitioned to an elected committee, four new members are elected each year to serve four-year terms and replace four legacy members on the 16-member committee. The second election of members to the Fusion Technology Standing Committee (FTC) will take place in 2019. A nominations subcommittee has been formed to identify candidates for election. All nominees must be either members in any grade of IEEE and NPSS or must have submitted an application for membership in IEEE and NPSS at the time the

nomination is forwarded to IEEE Headquarters in May. Graduate students, but not undergraduates, may apply. An affiliate member of NPSS is not eligible. Persons interested in running for election should contact Charles Neumeyer neumeyer@ieee.org.

A strong group of nominees was received for the 2019 Fusion Technology Award. As of the time of writing, the FTC is in the midst of selecting the winner who will be announced by the time of issue of this newsletter. The 2018 and 2019 awards will be presented at the banquet during the 28th Symposium on Fusion Engineering (SOFE), to be convened June 2nd – 6th, 2019 at the Sawgrass Marriott in Ponte Vedra Beach, Florida. (See cover story)

Charles Neumeyer, Chair of the Fusion Technology Technical Committee, can be reached by E-mail at Neumeyer@ieee.org.

Functional Committees

AWARDS

2018 IEEE Nuclear and Space Radiation Effects Conference Awards



Teresa Farris
Publicity Chair

It is a longstanding tradition of the IEEE Nuclear and Space Radiation Effects Conference to recognize the Outstanding Conference Paper and the Outstanding Data Workshop Presentation from the previous conference. In recent years recognition has also been given to the best paper presented by an IEEE Student Member, who must also be the first author. The awards process recognizes high quality and important work and also encourages authors to produce presentations and manuscripts of high technical quality, clarity of presentation, and significance to the community.

It is our pleasure to announce the award winners from the 2018 NSREC. Their awards will be presented at the 2019 Conference.

Outstanding Conference Paper and Outstanding Student Paper



A. Ildefonso
Outstanding NSREC and Outstanding Student Paper Awards

Optimizing Optical Parameters to Facilitate Correlation of Laser- and Heavy-Ion-Induced Single-Event Transients in SiGe HBTs

A. Ildefonso, Z. E. Fleetwood, G. N. Tzintzarov, J. M. Hales, D. Nergui, M. Frounchi, A. Khachatryan, S. P. Buchner, D. McMorro, J. H. Warner, J. Harms, A. Erickson, K. Voss, V. Ferlet-Cavrois, and J. D. Cressler

Meritorious Conference Paper

Directional Dependence of Co-60 Irradiation on the Total Dose Response of Flash Memories

M. J. Gadlage, D. I. Bruce, J. D. Ingalls, D. P. Bossev, M. McKinney and M. J. Kay

Teresa Farris, Radiation Effects Vice-chairperson for Publicity, can be reached by E-mail at Teresa.farris@cobham.co.

Outstanding Data Workshop Presentation

NASA Goddard Space Flight Center's Compendium of Recent Single Event Effects Results

M. V. O'Bryan, E. P. Wilcox, C. M. Szabo, M. D. Berg, K. A. LaBel, M. J. Campola, M. C. Casey, J-M. Lauenstein, J. A. Pellish, D. Chen, and E. J. Wyrwas

WE SHALL...

You can't escape necessities, but you can overcome them.

Seneca the younger

TILL IT BURSTS

There's only one thing that can keep growing without nourishment: the human ego.

Marshall Lumsden

I'M KEPT BUSY

The successful people are the ones who can think up things for the rest of us to keep busy at.

Don Marquis

WORTH THE WAIT

The oldest books are only just out to those who have not yet read them.

Samuel Butler

HEIGH-HO!, HEIGH-HO!

Inspiration is for amateurs. The rest of us just show up for work.

Chuck Close

2018 Radiation Instrumentation Awards Subcommittee Report



Chiara Guazzoni
2018 RISC Honors and Awards Subcommittee Chairperson

I had the honor to serve once again in 2018 as RISC Honors and Awards Subcommittee Chairperson and I would like to give you a brief report of this year’s activity.

Starting from 2018, RISC assigns three prestigious awards: the Radiation Instrumentation Early Career Award (RIECA), the newly established Emilio Gatti Technical Achievement Award and the Glenn F. Knoll Radiation Instrumentation Outstanding Achievement Award (RIOAA). One of the main commitments of the Subcommittee – and mine in particular – is conflict of interest management. Committee Members cannot nominate anybody for an award, nor can Committee Members provide evaluation for that nominee.

The Radiation Instrumentation Early Career Award is given to a young investigator in recognition of significant and innovative technical contributions to the fields of radiation instrumentation and measurement techniques for ionizing radiation. The prize consists of \$1,500 and an engraved plaque. We received eight new nominations for 2018 and included in the list of nominees also the two runners-up from last year’s selection process for reconsideration (the nominators have been asked to update their nominations for 2018). Unfortunately, not all nominations were of adequate profile for this award, probably because some of the nominators may have overlooked the difference between a grant (financial support in view of something) and an award (prize in recognition of something that has been achieved). The Committee decided to keep the two runners-up of this year for the 2019 edition of the award and the nominators will receive a request to update their nomination well in advance of the 2019 deadline. We announced the name of the winner on the 2018 IEEE Nuclear Science Symposium and Medical Imaging Conference website, prior to the conference, as done last year.

The 2018 Radiation Instrumentation Early Career Award was presented on Monday November 12th, 2018 during the opening ceremony of the 2018 Nuclear Science Symposium, in Sydney, to Jean-François Pratte, Associate Professor at the Université de Sherbrooke, Canada “for spearheading the development of per pixel picosecond timing with Single Photon Avalanche Diodes three-dimensionally integrated to custom readout circuits.” Gabriella Carini, Deputy Division Head at the Instrumentation Division of Brookhaven National Laboratory was Jean-François’s nominator. In addition to the certificate and the plaque, this year, for the first time, the awardee received a copy of the Glenn Knoll textbook dedicated to Jean-François by the NPSS President, Stefan Ritt.

Jean-François received his M.Sc. (2002) and Ph.D. (2008) degrees in Electrical Engineering from the Université de Sherbrooke, Sherbrooke, QC, Canada. While doing his Ph.D. work, he was a research engineer with the Instrumentation Division of Brookhaven National Laboratory (BNL), Upton, NY, USA. He was a key designer of the Rat Conscious Animal PET Scanner and the implementation of the first dual modality PET and magnetic resonance imaging scanner. In 2009, he joined the Electrical and Computer Engineering Department, Université de Sherbrooke, where he is currently a Tenured Professor. He is leading a research project on the 3-D vertical integration of single photon avalanche

photodiode arrays with CMOS readouts. He was a Member of the Steering Committee setting up the Institut Quantique, Université de Sherbrooke. His current research interest targets microsystem design and integration for radiation instrumentation, medical imaging (PET scanners), dark matter and neutrino experiments (nEXO), optoelectronic systems, the instrumentation of silicon-based electron spin qubits at cryogenic temperature, the instrumentation of quantum sensors and quantum key distribution.

This year for the first time, the awardees gave a talk on the research activity leading them to receive these prestigious awards. The title of the talk of Jean-François’s interesting talk was 3D digital SiPM for picosecond single photon timing resolution.

This year we established a new IEEE Technical Achievement Award in the field of Radiation Instrumentation, the IEEE Emilio Gatti Radiation Instrumentation Technical Achievement Award, to recognize a mid-career individual who has made significant and innovative technical contributions in the field of radiation detectors, radiation instrumentation and/or nuclear electronics, and measurement techniques for ionizing radiation. Unfortunately, we received no nomination for this first edition of the Emilio Gatti Technical Achievement Award, so, please, start to think now of deserving colleagues for a nomination next year.

The prestigious Glenn F. Knoll Radiation Instrumentation Outstanding Achievement Award is given to an individual in recognition of outstanding and enduring contributions to the field of radiation instrumentation. The prize consists of \$3,000 and an engraved plaque.

We received two new nominations for 2018 and included the two runners-up from last year’s selection process for reconsideration. This year in particular, all nominees and their nomination packages were extremely strong. While it is always our goal to have such a strong set of candidates, it makes the job of selecting the awardee extremely difficult. We will keep 2018’s two runners-up for the 2019 edition of the award and the nominators will receive a request to update their nomination well in advance of the 2019 deadline. After careful consideration, we announced the name of the winner on the 2018 IEEE Nuclear Science Symposium and Medical Imaging Conference website, prior to the conference, as done last year.

The 2018 Glenn Knoll Radiation Instrumentation Outstanding Achievement Award was presented on November 12th, 2018 during the opening ceremony of the 2018 Nuclear Science Symposium, at the International Conference Center in Sydney, to Marek Moszynski, Professor at the National Center for Nuclear Research, Swierk, Poland “for outstanding contribution to the modern scintillation detectors in application to physics, medicine and homeland security.” The nominator of Marek is Lukasz Swiderski, associate professor at the same center.

Marek Moszynski received his M.S. degree from Warsaw Technical University, Poland in nuclear electronics and he began working at the Institute for Nuclear Research in Swierk (Poland). In 1969 he received his Ph.D. and in 1971 his D.Sc. (habilitation). In 1972 he became an Associate Professor and in 1981 a Full Professor at the Institute. After the latest reorganization of the Institute, in 2011, he has become professor at the National Centre for Nuclear Research.

His scientific activity is mainly devoted to nuclear radiation detection techniques and methods. He is an expert in scintillation detection, particularly in fast timing, gamma spectroscopy and fast neutron detection. He was a member of the group that first developed time-of-flight PET at LETI Grenoble, France and discovered the fast component of BaF2 scintillator. At Brookhaven National Lab he has developed, with a group of physicists, the method of picosecond lifetime measurements of nuclear states. It is difficult to do justice to Marek’s diverse contributions. He was also involved in a number of European collaborations in nuclear



The awardees after receiving their plaques during the opening session of the 2018 IEEE Nuclear Science Symposium in Sydney on November 12th, 2018. From left to right: Stefan Ritt (NPSS President), Stefan Gundacker (Glenn F. Knoll Postdoctoral Education Grant), Marek Moszynski (2018 IEEE Glenn F. Knoll Radiation Instrumentation Outstanding Achievement Award), Jean-François Pratte (2018 IEEE Radiation Instrumentation Early Career Award), Craig Woody (2018 NSS Program Co-Chair), and Chiara Guazzoni (2018 RISC Honors and Awards Subcommittee Chairperson).

Photograph by Ralf Engels

structure physics, including NORDBALL, DEMON, EUROGRAM, EUROBALL and NEDA. At present he is involved in the study of new inorganic scintillators, avalanche photodiodes, silicon photomultipliers and different aspects of scintillation detection, such as energy resolution and non-proportional response of scintillators in application to nuclear medicine and homeland security.

He is a referee and member of the editorial boards of many of the most prestigious journals and transactions in our field. As the author of more than 300 papers and an H-index of 43 according to the Web of Science citation index, he has received many awards in recognition of his activity; he became an IEEE Fellow in 2006.

Marek guided us in a life-long journey on his research activity in the field of scintillators leading him to receive this prestigious award. The title of his talk was Contributions to scintillation research and applications.

In the June issue of this NPSS Newsletter you will read more about the research that led J-F Pratte and Marek Moszynski to these prestigious awards.

Start thinking now to nominate one of your colleagues or your coworkers for the 2019 RISC Awards, the deadline will be the middle of July. Find more details on the NPSS website or in the June issue of the NPSS Newsletter.

Allow me to end on a personal note, 2018 was the last year in which I served as RISC Honors and Awards Subcommittee Chairperson, since starting January 2019 I am serving as RISC Chairperson for the 2019-2020 term. I really enjoyed the three years I had in this role and I received much more than I gave. I had the chance to meet talented young researchers and to study their research activity, sharing their emotion when receiving the Radiation Instrumentation Early Career Award. My memory goes back to the 2004 Nuclear Science Symposium in Rome, where I received the first edition of the Radiation Instrumentation Early Career Award and Emilio Gatti received the Radiation Instrumentation Outstanding Achievement Award. For me this award was really the gateway towards maturity in professional activity. I had the honor to celebrate with mentors and role models receiving the highest award given by RISC, the Glenn F. Knoll Outstanding Achievement Award, and I had the pleasure to assist in the establishment of a novel RISC award, the Emilio Gatti Technical Achievement Award, in memory of my scientific “Grandfather,” mentor and role model. I wish that whomever serves in this role in the future will have the same lucky and joyful experience.

Chiara Guazzoni, 2018 RISC Awards Subcommittee Chair and new RISC Chair, can be reached by E-mail at Chiara.Guazzoni@mi.infn.it

CHAPTERS



Steve Gold
Chapters Chair

Section Chapters are local units of the IEEE that are part of their Region and Section, but are affiliated with one (or sometimes several) IEEE Societies. Student Branch Chapters (SBCs) are student-run organizations that are formed within an IEEE university student branch, but are affiliated with an IEEE Society. Both section chapters and SBCs exist to support local activities in the technical areas of interest of our members, including lectures, workshops, volunteer projects, and social activities. Both types of chapters provide opportunities for networking as well as leadership training. The goal of the NPSS chapters program is to provide technical and financial support to our existing roster



Chapters

Continued from **PAGE 7**

of chapters, and to promote the formation of new NPSS chapters.

Calendar year 2018 was another banner year of growth for NPSS chapters, with the formation of one new section chapter and five SBCs. First, in early February, the new Cleveland Section joint chapter (SP/NPS/EMB/IM) was formed by the reorganization of an existing EMB joint chapter that did not include NPSS participation. Its organizer and chair is Steven Galecki, Chair of the Cleveland Section. Next, in late May, the new Texas Tech University SBC was established. Its faculty advisor is Prof. Andreas Neuber, and its founding chair is Henry Gaus. Melvin Powell, the cofounder of the chapter, accepted NPSS Chapter Founder's Plaques for Henry and himself at the awards banquet of the 2018 IEEE International Conference on Plasma Science (ICOPS 2018). The new chapter has already hosted an NPSS Distinguished Lecture, with another scheduled. Then in late August, the University of San Diego SBC was established. Its faculty advisor is Prof. Farhat Beg. Its founding chair, Joseph Strehlow, and its cofounder and vice-chair, Nicholas Aybar, also received Chapter Founder's Plaques, which will be publicly presented in 2019. Also in late August, the A.D. Patel Institute of Technology

(ADIT) SBC was established in Gujarat, India. Its faculty advisor is Prof. Asifqbal Thakor, and its founding chair is Sarthak Shah, who also chaired the institute's IEEE student branch. Sarthak received a Chapter Founder's Plaque at the Inspiro '18 student conference in Gujarat, which he had helped to organize, and which was cosponsored by the NPSS. Finally, in early November 2018, two new SBCs were established, the first at the Birla Vishvakarma Mahavidyalaya College (BVM), whose faculty advisor and founding chair are Chandni Desai and Khushbu Chandarana, respectively, and the second at the Madhuben and Bhanubhai Patel Women Institute of Engineering for Studies and Research in Computer and Communication Technology (MBICT), whose faculty advisor and founding Chair are Prof. Nirali Pandya and Vrusha Naik. Both of these institutions are also located in Gujarat, India, and both founding chairs will receive Chapter Founder's Plaques in early 2019. With these additions, the NPSS now has 23 section chapters and joint chapters and 9 student branch chapters, as shown on the accompanying map. In addition, efforts are in progress to form additional new section chapters and SBCs at a number of locations around the world.

The NPSS provides expert lecturers through its Distinguished Lecturers program, at no cost to the chapter, as well as chapter financial support. The Chapters chair and AdCom members will provide enthusiastic advice and assistance in the formation

of new chapters, wherever there is interest and enough NPSS members to support a local chapter. Detailed information on our chapters program can be found at <http://iee-npss.org/chapters/>.

If you are interested in establishing a local chapter of the NPSS, please contact Steve Gold, the NPSS Chapter Coordinator, at steeve@iee-npss.org.

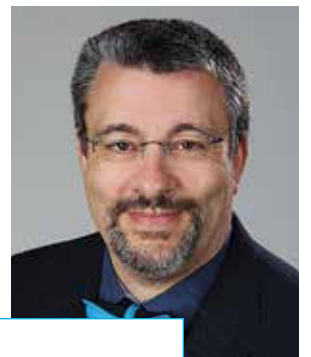
NOMINATIONS

Four NPSS AdCom Positions Open for Nomination

The NPSS Administrative Committee (AdCom) consists of various members including elected members from our eight Technical Committees (TC). The following TCs have open positions starting in 2020 for a term of four years:

- » Fusion Technology (FTC)
- » Plasma Science and Applications (PSAC)
- » Pulsed Power Science and Technology (PPST)
- » Radiation Effects (REC)

If you are interested in one of these positions or want to nominate somebody, please contact our Nominations Chair Stefan Ritt at stefan.ritt@psi.ch. Candidates must be members in good standing



Stefan Ritt
Nominations Committee Chair

of the NPSS and the IEEE. Each nomination must contain a statement of the willingness and ability of the nominee to serve if elected, the membership status and member number of the nominee, a short biography, and a statement of topics that the candidate wishes to address as an AdCom member. Nominations must be sent to the Nominations Chair before June 1, 2019.

*Stefan Ritt, Nominations Chair, can be reached by Phone at +41 56 310 3728
E-mail at stefan.ritt@psi.ch.*

SWEET TALK??

[She] told enough white lies to ice a wedding cake.
Margot Asquith

Liaison Reports

EDUCATIONAL ACTIVITIES BOARD



Edl Schamiloglu
NPSS Liaison to EAB

2019 TryEngineering Summer Institute

The TryEngineering Summer Institute (formerly TryEngineering Summer Camps) has a new look and feel. Great activities are planned for July 2019. Organized in two-week sessions each summer, on three dynamic college campuses across the United States, the TryEngineering Summer Institute unites students from around the world—co-ed, between 12-17 years old - to:

- » engage in hands-on design challenges
- » experience the work firsthand with behind-the-scenes tours with real-life engineers

» discover not just what's happening today, but what's coming tomorrow, through conversations with renowned guest speakers and incredible Summer Institute counselors.

The on-line brochure is available at: <http://www.ieee.org/ns/periodicals/TryEngineering/2019Program/index.html>

2019 EAB Meetings

IEEE Educational Activities Board Meeting—WebEx
Saturday 16 February 2019
Tampa, Florida, USA

IEEE Educational Activities Board Meeting
Saturday 22 June 2019
Atlanta, GA, USA

IEEE Educational Activities Board Meeting
Saturday 23 November 2019
Boston, MA, USA

Edl Schamiloglu, IEEE NPSS Liaison to EAB, can be reached by E-mail at edls@unm.edu

INESCAPABLE CONCLUSION

I have given the matter the fullest consideration and, having examined the problem from all angles, reached the conclusion that it was because I didn't get enough votes.

Howard Green (explaining his election defeat)

WHAT'S THIS ABOUT "CAT GOT YOUR TONGUE"?

If cats could talk, they wouldn't

Nan Porter

IEEE Smart Village (ISV)

2018—Another Year of Accomplishment



Ray Larsen
IEEE Smart Village Chairman; Liaison to ISV and IEEE Humanitarian Activities

HIGHLIGHTS—ELECTRICITY, EDUCATION, ENTERPRISE—THREE PILLARS

Education: In 2018 the program received a major boost in Education with a grant of \$500,000 from IEEE Power and Energy Society, allocated to existing approved Three-Pillar projects in eight countries. Additional Education funds were raised from NPSS, and ON Semiconductor which has operations in Vietnam. The entire education program for Vietnam was named STEAM, i.e. STEM with an added Arts and Language component as a goal to teach not just the sciences but bilingualism

and sustainable development strategies throughout the school system in the face of climate change in which, according to World Bank, Vietnam is one of five most vulnerable countries on the globe. Education funds are needed over and above the plans for the Electricity component.

Electricity: All projects aim to deliver reliable electricity to off-grid areas (or those with unreliable grid power), but also plan to deliver connectivity, mainly for school networks, modeled after the IEEE Global Classroom model at the Posner Center for International Development in Denver CO. ISV also provides sustainable development scholarship assistance for its entrepreneurs to take either Certificate or Masters of Development Practice degrees delivered globally by Internet and intranet to anywhere in the world at extremely low cost. The three-year Master's program, MDP, graduated its first class in 2018 including a number of ISV entrepreneurs; this includes entrepreneurial business training and a field practicum in the final year.

Enterprise (Entrepreneurialism): At the core of the ISV Theory of Change are the Three-Pillars needed for sustainability, but also includes forming partnerships with similar-minded organizations providing clean water,

ISV IMPACT 2018

Expanding access to electricity, education, and communication across the developing world—IEEE has brought safe, clean, affordable and sustainable electricity to remote villages in Africa, East Asia, and the Pacific as part of the innovative Smart Village initiative pioneered by IEEE volunteers, staff and benefactors.

300,000+ Village Lives Transformed with Power - YE 2018

37,000 Students & 48 Village Community Members

1.08 Megawatts of Solar Power installed
36+ Micro Utilities established

24 Projects with Kick-Start funding of \$2.5M ('17 & '18)

Comprehensive 3-Pillar Program
Electrification, Education, Enterprise Development
Projects recognized by World Bank, Rockefeller Foundation, African Development Bank, India Corporate Social Responsibility supporters

Program is near doubling in growth each year. Potentially reaching a half million people in 2019

sanitation and hygiene (WASH) programs which are equally vital. The Papua New Guinea program is coupled with a Rotary International WASH program, as is a new program forming in Guatemala connected to Healing Waters and education sponsored by Mercy Corps. ISV is making progress with these partnerships for broadening scope and fundraising capacity.

New India Working Group (IWG): Since India has as many IEEE members as the U.S. but with over one billion people, many below the poverty line, it is an area of huge need and opportunity to serve. Our on-the-ground part time consultant has proposed a working group to emulate and expand the work of ISV. IEEE Foundation also has a staff person at the India GIEEE office in Bangalore, and another retired professional connected to both ERDA and TATA companies to help with development (fundraising). The IWG is in process of forming an exciting new partnership with the WHEELS Global Foundation, based in India and the U.S., connected with India

Institute of Technology (IIT) and currently specializing in WASH programs, a very complementary fit with ISV; a first joint venture for a village of about 8,000 has started planning and its goals of expanding to hundreds of villages are being visualized.

Challenges: ISV has enjoyed three years of special Launch Funding from IEEE Foundation (IEEEF) which ended in 2018; thus our budget drops by about a half million dollars which we have to raise with new partnerships and grants. We are optimistic since our visibility with World Bank, Rockefeller, WHEELS, Rotary and Mercy Corps is continually growing, but all fundraising takes a long time to establish partnerships and major donors that are willing to commit hundreds of thousands or millions of dollars per year to the empowerment of some of the

poorest people on the planet who are truly capable of self-sufficiency and creativity given the opportunities IEEE Smart Village is trying to deliver. IEEE Societies are another potential source of major funding who will embrace this most worthy All-IEEE effort of “Advancing Technology for Humanity.” Special thanks to those already engaged led jointly by PES and NPSS.

Ray Larsen, ISV Chair, IEEE Life Fellow, NPSS Past President and ISV/Humanitarian Activities/SSIT Liaison and PES Member can be reached by E-mail at larsen@slac.stanford.edu.

General Purpose Readout Board π LUP: Overview and Results

Since the late 1950s, particle accelerators have been used by physicists all over the world to investigate the fundamental structure of the universe. Over the years, the energy and performance obtained have improved a lot. Currently, the largest and most powerful particle accelerator is the Large Hadron Collider (LHC) located at CERN in Geneva, Switzerland. It is capable of reaching a center of mass energy of 13 TeV. Over the next several years, LHC will undergo a series of major upgrades focused on increasing its luminosity, i.e., an operational parameter directly correlated to the number of observed events [1]. The purpose of this upgrade is to improve the physics measurements and searches by increasing the statistics of collected events.



Nico Giangiacomi
2018 Student Paper Award Recipient

All the experiments located at LHC (such as the ATLAS experiment) will be upgraded as well, in order to meet the requirements imposed by the future physics programs. The key factors that will affect all the detectors are two: the increase of instantaneous luminosity - corresponding to an increase of the simultaneous collisions and hence of the amount of total data per time unit - and of the trigger rate, that will be on the order of 1 MHz, ten times higher than the current rate of ~100 kHz. The combination of those two factors constitutes a major challenge for the electronic readout systems, since it directly affects the total throughput, i.e., the amount of data transmitted per time unit. The current readout system cannot cope with those more rigorous conditions, and new technologies must be exploited.

The purpose of this paper is to introduce a new readout card, called Pixel detector Luminosity Upgrade board (π LUP), which has been developed jointly by the University and INFN of Bologna as a proposed readout upgrade system for the ATLAS experiment. Compared with the current ATLAS readout [2], the π LUP implements more recent technologies, such as 7th-series Xilinx FPGAs, and offers more bandwidth. The VME bus technology adopted by the great majority of the ATLAS readout boards has been replaced by PCIeExpress, which is more recent and has higher performance.

π LUP BOARD OVERVIEW AND RESULTS

The π LUP board, shown in Figure 1, features two Xilinx 7th series FPGAs, a Zynq-7 and a Kintex-7, arranged in a Master/Slave architecture and connected together by a bus - namely KZbus - composed of five single-ended and 21 differential lines. The Zynq-7 is the master FPGA and is in charge of controlling the data flow and status of the system. It implements an embedded dual-core ARM processor where a Xilinx PetaLinux kernel is run. All the communications from the outside with the processor utilities happens via either serial or Ethernet connection. The Kintex-7 FPGA, on the other hand, handles all the high speed I/O communications through 16 internal physical transceivers (GTx) [3] running at up to 12 Gbps. The transceivers are connected to several types of connectors (PCIe, SFP+, FMC, Gbit-Ethernet) making the board highly versatile and able to interface a wide variety of other electronic devices and Front-End chips. Figure 2 (a) and (b) shows “Eye Diagram” scans obtained for some of the I/O connectors on the board after running at 5 Gbps and 10 Gbps respectively on each line. The diagrams were obtained using the Vivado IBERT Core [5]. The choice of having two FPGAs connected in a Master/Slave mode guarantees enough power to perform high-level control operation on the board (Zynq-7 ARM core) and to handle I/O communications through several different protocols (Kintex 7) while at the same time maintaining a relatively low price.

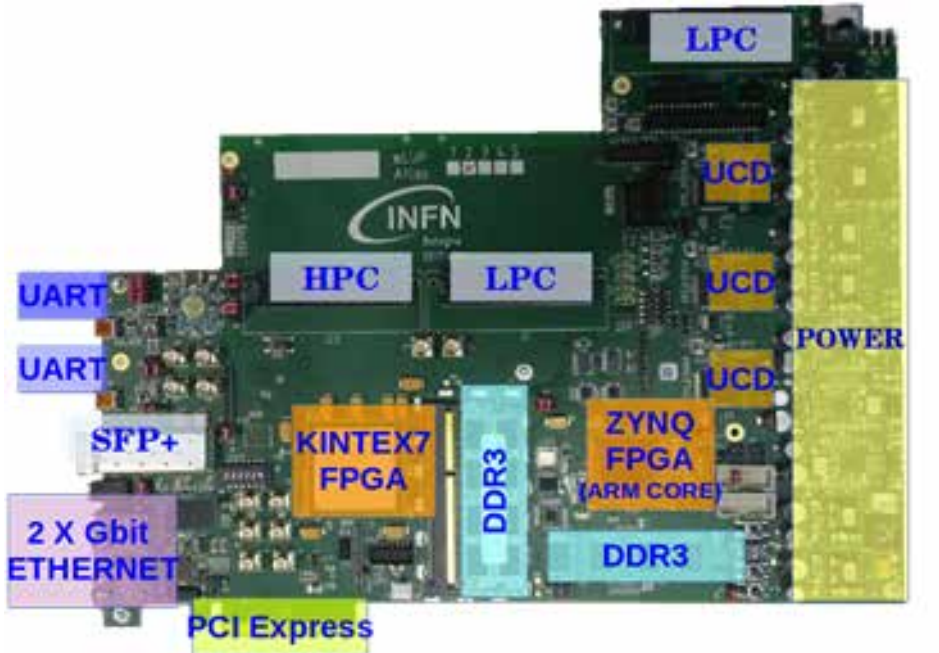


Figure 1: Bologna π LUP v1.1 board. FPGAs, I/O ports and other main components are highlighted in the picture.

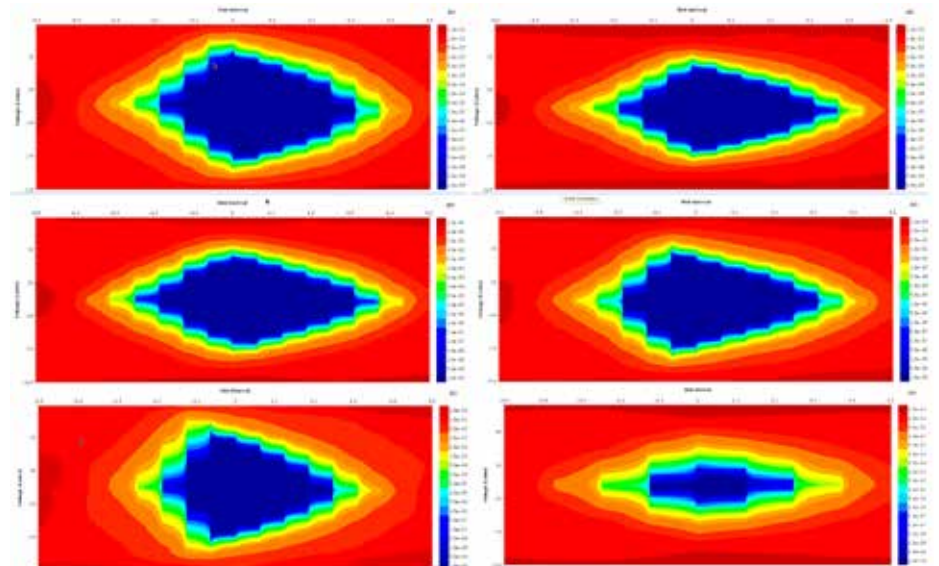
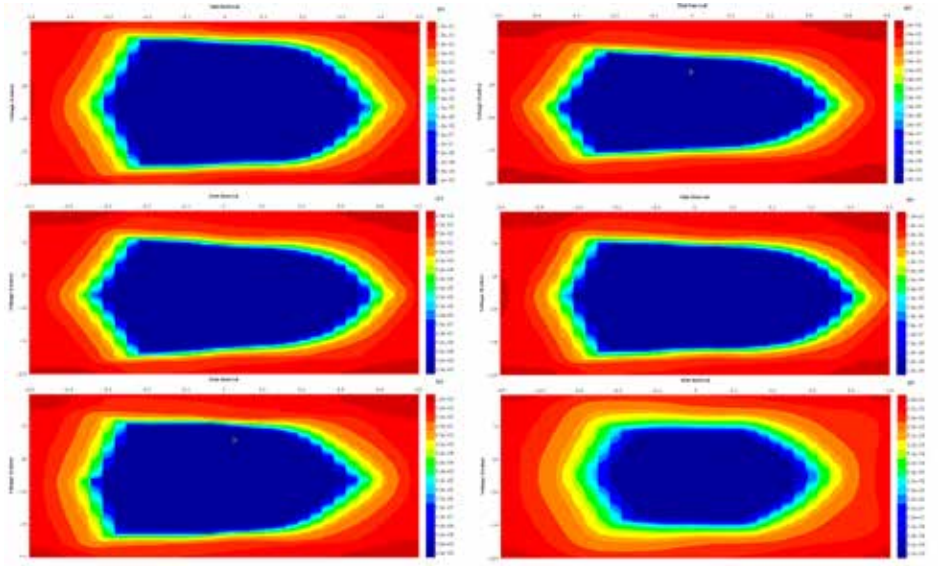


Figure 2: Eye Diagram scan results run at 5 Gbps (a) and 10 Gbps (b), PRBS 31bit and BER 10⁻⁹ of: FMT HPC MGT0 (top left), FMT HPC MGT 1 (top right), FMT HPC MGT 2 (middle left), FMT HPC MGT 3 (middle right), SFP+ (bottom left) and SMA MGT (bottom right).

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TAKE A DEEP BREATH—PLEASE!

There's so much pollution in the air now that if it weren't for our lungs there'd be no place to put it all.
Robert Orben

KNOW-IT-ALL'S FAILURE

The greatest obstacle to discovery is not ignorance – it is the illusion of knowledge.
Daniel Boorstin

BUT THEY DON'T TALK BACK

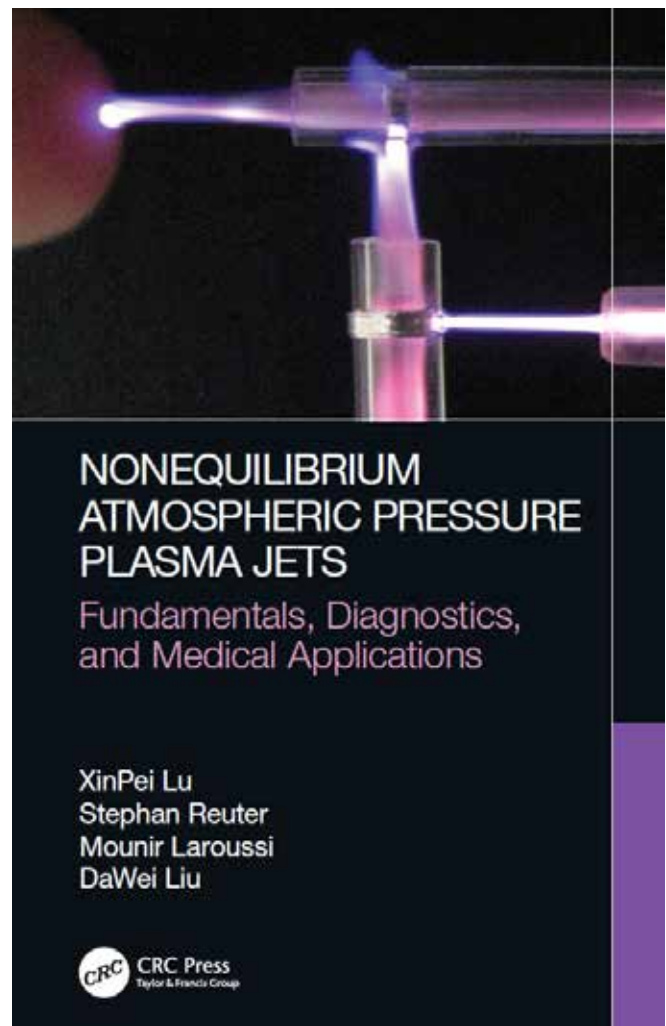
Being president is very much like running a cemetery; you've got a lot of people under you but they are not listening.
Bill Clinton

New Book on Low Temperature Plasma Jets and Their Medical Applications

The biomedical applications of atmospheric pressure low temperature plasmas started in the mid-1990s when it was shown that these plasmas have strong germicidal properties [1]. This groundbreaking experiment showed that the reactive species and the charged particles produced by an atmospheric pressure, ambient temperature plasma can be transported to interact with biological cells and induce cell inactivation/death. Soon after that and for the benefit of medical applications, a need for plasma sources that can deliver plasma outside the confinement of electrodes arose. This requirement was achieved by the development of low temperature plasma jets that are able to provide plasma plumes outside the discharge gap and into the ambient environment [2]. These devices are known today as non-equilibrium atmospheric pressure plasma jets (N-APPJ). In recent years these plasma jets have been successfully used by various investigators for the inactivation of bacteria, wound healing, and the killing of cancer cells [3] – [6]. This new book, published by CRC press, contains 9 chapters that cover extensively the physics, engineering, diagnostics, and medical applications of N-APPJs. In particular, the book gives a detailed coverage of the plasma bullets (guided ionization waves) that enable the propagation of the plasma plumes. These guided ionization waves were discovered in the mid-2000s and were shown to be the mechanism whereby the plasma exits the nozzle of the plasma jet and propagate at hypersonic velocities in the ambient air [7]. The last chapter of the book focuses mainly on the cancer applications of N-APPJs. Figure 1 is an image of the front cover of the book.



Mounir Laroussi
Old Dominion University



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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 5, 2019 for the June 2019 Newsletter.

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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