International Conference on Plasma Science, to be held in Atlantic City, New Jersey, USA

The 44th annual IEEE International Conference on Plasma Science (ICOPS 2017) will be held from May 21st to May 25th, 2017 at the world-famous resort city of Atlantic City in the State of New Jersey on the east coast of the United States of America.

The General Chair of ICOPS 2017 is Dr. Jose L. Lopez of Seton Hall University, USA. Dr. Kurt H. Becker of New York University, USA serves as the Technical Program Chair. An electrifying scientific program is planned for the 2017 meeting covering seven technical areas:

1. Basic Processes in Fully and Partially Ionized Plasmas chaired by Dr. Wei Dong Zhu of Saint Peter's University, USA.
2. Microwave Generation and Plasma Interactions chaired by Dr. Sarita Devi Prasad of the University of New Mexico, USA.
3. Charged Particle Beams and Sources chaired by Dr. Evgeniya Lock of the U.S. Naval Research Laboratory, USA.
4. High Energy Density Plasmas and Applications chaired by Dr. Christine Cordero of Sandia National Laboratories, USA.
5. Industrial, Commercial, and Medical Plasma Applications chaired by Dr. Gregory Fridman of Drexel University, USA.
6. Plasma Diagnostics chaired by Dr. Achen von Keudell of Ruhr University, Bochum, Germany.
7. Pulsed Power and Other Plasma Applications chaired by Dr. Tao Shao of the Chinese Academy of Sciences, China.

The selection of the State of New Jersey for ICOPS 2017 is very special in many ways, particularly because several important discoveries in the early historical development of plasma science and technology occurred in New Jersey. Such early plasma science pioneers as Irving Langmuir and in later years Lyman Spitzer worked in New Jersey. Further, there is a large concentration of plasma researchers throughout New Jersey particularly connected with the U.S. Department of Energy’s Princeton Plasma Physics Laboratory. The location of Atlantic City with its close proximity to the New York, Philadelphia, and Washington D.C. metropolitan areas will allow for a greater participation than usual due to the large concentration of plasma science researchers in the region of the United States. Further, the comprehensive transportation hub in the region will allow for easy access of many international plasma researchers from all over the globe.

ICOPS 2017 is therefore a singular forum to experience and showcase the most important and exciting discoveries in contemporary plasma science, to engage with the world’s leading experts, and to update one’s own understanding of how today’s plasma science impacts science policy, industry, and society at large. The technical program of ICOPS 2017 will be anchored by seven notable plenary sessions and a program of invited talks (to be selected from abstracts submitted), many given by prominent scholars, international award winners, and Fellows of IEEE. The confirmed plenary sessions for ICOPS 2017 will be given by international, award-winning leaders in plasma science:
PPC2017, 21st International Pulsed Power Conference
Brighton, United Kingdom, 18th to 22nd June, 2017

For the first time since its inception in 1976, the biennial Pulsed Power Conference will be held outside of the USA at the seaside town of Brighton in the United Kingdom. The Pulsed Power Conferences traditionally attract papers from countries spanning the globe and this year will be no exception. The very high level of interdisciplinary expertise shown both in the background of the minicourse instructors and the topics of the minicourse makes it an exceptionally rare opportunity for participants to gain an in-depth understanding of the scientific phenomena, the opportunities, the applications, and the challenges in the scientific field of charged-particle beams and high-powered pulsed sources.

Atlantic City, a major resort destination, needs no introduction. Its Boardwalk is famous worldwide and the City’s colorful history inspired the famous Monopoly board game. Atlantic City offers a unique opportunity to enjoy classic Americana and modern life in the United States. It is also an excellent location to explore many areas of historic significance with the State of New Jersey being one of the original founding thirteen colonies of the United States of America. The uniqueness of Atlantic City as an American cultural center rivals the quality of the scientific and technical program of PPC 2017, making PPC 2017 the plasma conference of choice in 2017. The conference venue will be the newly built Waterfront Conference Center at the Harrah’s Resort in Atlantic City, New Jersey, USA. Additional details regarding the conference including the technical and social programs in this historic resort and meeting venue to best organize your trip to participate may be found at: http://www.pci.org/ icops2017

Jose Lopez, Conference General Chair, can be reached by E-mail at jlopez1@shu.edu

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The international technical committee, led by Professor Bucur Novac, has been working hard to bring together an excellent technical program encompassing the full technical and geographical breadth of the Pulsed Power community, covering the areas:

• Pulsed-Power Technologies and Thin Insulation
• Pulsed-Power Industrial and Biomimetic Applications
• High-Power Microwaves, RF Sources and Antennas
• High-Energy-Density Physics and Technology
• Particle-Beam and Accelerator Technologies
• High-Power Electronics

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Abstract submission is now closed. Authors of accepted abstracts should receive notice by early April to allow time to prepare for the conference and to write manuscripts for the conference proceedings. In addition to the conference proceedings, there is a special issue in the IEEE Transactions on Plasma Science for each conference. Submissions to the journal are expected to be expanded versions of the conference submissions and will be subject to the full peer-review process. Deadlines for the journal submissions will be announced at the conference.

In addition to the oral and poster presentations, the conference will have four plenary speakers, one of whose talks will open the conference each day. Please check the conference website www.ppc2017.org for details on our plenary speakers.

In addition to the technical program, PPC 2017 will have one of the largest exhibition spaces of recent Pulsed Power conferences. This will enable a broad range of exhibitors to attend the conference to discuss the latest technologies and products of interest to the Pulsed Power community.

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NPSS NEWS

July 17th, a Radiation Effects Data Workshop, effects, an up-to-date Short Course, offered on consisting of ten sessions of contributed papers The conference will feature a Technical Program the New Orleans Marriott. The General Chair is 

Sessions and speakers for the four sessions are: 

1) Total Nonionizing Gain and Displacement Damage Hardness Assurance for Satellite Systems, Dr. Chetan Poyre, European Space Agency ESA/ESTEC. 

2) Single-Event Effects: Radiation Hardness Assurance for Space-borne Systems, Dr. Ray Ladbury, NASA/GSFC. 

3) Introduction to Synopsys and Cornering Factors for Mission Success, Prof. Michael Swathout, Saint Louis University 

4) Design Principles for Mission Success in Spacecraft Programs, Dr. Dave Roth, John Hopkins Applied Physics Lab 

TECHNICAL PROGRAM

The Technical Program Chair is Heather Quinn, Los Alamos National Laboratory. She and her 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, as well as semiconductor processing technology and techniques for producing radiation-tolerant devices and integrated circuits. The Poster Session Chair is Marta Bagatin, University of Padova. The Data Workshop Chair is Jeff George, Aerospace Corporation. 

The Technical Session Chairs are: 

- Basic Mechanisms of Radiation Effects—Elizabeth Auden, Sandia National Labs 

- Dosimetry—Ewart Blackmore, TRUMF 

- Hardness Assurance—Jeremy Roch, University of Montpellier 

- Hardening by Design—Mike Within, Bru 

- Photonics Devices and ICs—Joe Smir, The Aerospace Corporation 

- Radiation Effects in Devices and ICs—Tim Oldham, Ball Aerospace 

- Single-Event Effects: Mechanisms and Modeling—Laurent Attilio, ONERA 

- Single-Event Effects: Transient Characterization—Shi Wen, Cisco 

- Single-Event Effects: Devices and ICs—Paolo Rech, UFRGS 

- Space and Terrestrial Environment—Pete Truscott, Ballbo 

Another topic is the use of conference software across our portfolio of conferences. This covers the conference registration, paper submission and review, conference agenda, up/download of presentation slides, proceedings submission, user feedback and evaluation, and finally some mobile app use. Many conferences use some proprietary solutions for these tasks. Offering some NPSS-wide solutions might not only improve the user experience for people attending more than one of our conferences, but might also save the jibs of our conference organizers and save money and thus reduce registration fees for our attendees. My goal is to make several software packages available from which each conference can choose, all of them well maintained and documented. A conference organizer’s forum in the form of a web site or blog should ensure that information flows between different conferences, even coming from different technical communities within our society. This gives the people the chance to exchange experiences not only about conference software but also about other topics such as best practices for improving the user experience and special conference events such as Women in Engineering (WIE) and Young Professional (YP) events. We have great people on every conference organizing committee, and it is important that we learn as much as possible from each other. 

I am very proud to be part of NPSS and serve as President for the next two years. First of all, I would like to thank our President John Verboncouer for mentoring me during the past two years and for his outstanding leadership during this time. John worked diligently to serve our society and demonstrated an unflinching sense of fairness. He never hesitated to stand up and advocate our position if something was not right, to the great benefit of the whole society. I thank our past two Presidents Craig Woody and Janet Barth, our secretaries Ali Barsani, our treasurer Ron Keyser, our committee chairs Kay Fleischer, Bill Moses, Patrick Le Dö (RTIC), Ronald Jaccard (NWSIC), William Moses (Conferences), Don Shnkr (PASAC) and Mark Tillik (FAC). It was a great pleasure working with you and I hope to see you in one or another function in the future. On the other hand I would like to welcome our new AdCom members Grao Da Vie (WMI), Lorenzo Fabits (RTIC), Martin Grossmann (CAMS), Michael Kong (PASAC), Susanne Kuhn (Conferences), Faika Piltz (FAC), Verena Sossi (NWSIC), Dennis Youngschock (FAC) and Helge Köthe, who will be the first incumbent of the newly created position of Industry Liaison. I am looking forward to working with you and to having many fruitful discussions. Having four out of seven new AdCom members coming from Region 7 (Canada and 6 (Africa, Europe, Middle East) underlines the increasing internationality of our organization, the borderless spirit and the dissemination of knowledge worldwide. I am joined now by our new Vice-President/President Elect, Ron Schmirtz from Vanderbilt University, who serves on AdCom as Elected Member for Radiation Effects (REC). Our past Presidents follow the traditional progression, so John Verboncouer is now Chair of our Nominations Committee and Janet Barth is Chair of our Awards Committee. I would like to thank all our Committee members for their devoted efforts in making NPSS a successful society, and I wish our new members all the best in their new positions. 

It is hard to improve a society that already runs well, but I see some opportunities I would like to concentrate on during my term. From a computing community, these are naturally in the area of social media and software packages. Since March 2014, in addition to our NPSS website http://www.ieee-npss.org, an NPSS Facebook page https://www.facebook.com/npssieee which I would like to strengthen with more contributions. Having more than four thousand followers gives us a huge potential for possible outreach. If you want to advertise a conference, have some nice pictures from an NPSS event, see a good review article in one of our journals, or have anything else which could be interesting to our community, please post it on that page or send it to me and I will post it on behalf of our society. Thanks to all NPSS volunteers and the whole membership for keeping our Society healthy, active and involved with our community. Please contact me if you see any opportunity for even further improvement, or if you are interested to become active as a volunteer. I am looking forward to meeting many of you during my term and finding ways to make our Society serve you even better. I wish everybody a magic moment like the one I had years ago with the Ethernet UDP packets, which was a key experience and had a significant impact on my career, and which I would have missed without IEEE and NPSS. 

Stefan Farris IEEE NPSS President

It is my distinct honor to write my first newsletter article as NPSS president for the two-year term 2017-2018. Let me start with a little personal story. Many years ago, I attended one of my first IEEE conferences. There was one presentation about a new way to send Ethernet UDP packets right out of a field-programmable gate array (FPGA) without any CPU. I was very excited about this and approached the author, who told me all the details. Back at my home lab, PSI in Switzerland, where I do basic research in particle physics, I speeded the news to several electronics groups. Today, we use exactly this technique that I learned at that IEEE conference in dozens of different experiments at various accelerators and synchrotron light sources. As I write these lines, I sit next to a brand new data acquisition crate we recently designed at our lab, which would not work without this technology. This is, in my opinion, the core of IEEE and NPSS. Read our journals, go to our conferences, to stay current with technology. If you get more experienced over time, spread your great ideas through publishing and presentations. You won’t only build up a network of fantastic people, but learn great things which make your life as an engineer or researcher much easier. I take the lead of the new Asia Scinences Society which aims extremely well thanks to the endless efforts by many volunteers. These are the members of the Administrative Committee (AdCom), our conference organizers, paper reviewers and many others. I would like to take the opportunity to express my deepest gratitude to those who left AdCom at the end of last year. These are in alphabetical order Gerry Cooperstein (Nominations), Patrick Le Dö (RTIC), Ronald Jaccard (NWSIC), John Ruskin 

CONFERENCES CONTINUED /SOCIETY GENERAL BUSINESS
The new Division IV director is Jennifer Barham from the Antennas and Propagation Society.

Bill Messos, the Division IV incumbent at the time of our AdCom meeting, noted that since 2011 IEEE is spending more than it earns, which is not a healthy policy. This has been due to several large initiatives, including Collaborative Research and RIP development. With no new major development projects, IEEE should be running in the black and not borrowing to fund operations or new projects. Money has been borrowed from reserves. The current CIO believes that reserves should be used for risk protection and to fund strategic initiatives of IEEE. The use by OUs such as societies to use reserves to fund their own strategic initiatives would be curtailed, although most of the money in reserves has come from OUs, and especially from society conferences and journals. However, with interest, dividends and market gains, IEEE has been in the black and so not all of these items have been used. The result is that reserves have increased.

TECHNICAL COMMITTEES

Our treasurer reported that many conferences are doing well. Our transactions on Medical Imaging did not. Income from Transactions on Medical Imaging was not reflected in our budget. Our new journal, launching in January 2017 is not expected to see income for the next year or two.

John Verboncoeur, our President for 2015 and 2016, reported that he had attended many meetings including TAB, the EECs of PAST and PSAC and other committees related to TAB in 2015. The IEEE to vote on the amendment to the Constitution failed. However, in 2015 activity will not go forward, but the TAB in 2030 committee will work toward it. The IEEE in 2030. The IEEE vote to amend the Constitution to increase the meetings including TAB, the ExComs of PAST and PSAC. New Technical Committee chairs include Fulvia Jaszczak and Mark Tillack for their service to their communities, NVMC and Fusci, respectively, and welcome Venia Sessi and Dennis Youchison who will now represent these communities. Brendan Godfrey and Christian Bohm have each been awarded an advanced term representing Plasma Science and the Transnational community respectively. New Technical Committee chairs include Fabia Pilat replacing Steve Coury (PAST), Michael Kong replacing Don Shiffer (PSAC) and Lorenzo Fabris replacing Pat Li Di (RTF). See below for the brief biographies of our new officers and members.

AdCom Functional Committees and Liaisons were also busy. Please see individual reports for updates. One particular note was the successful instrumentation School held in Hoi Chi Minh City, Vietnam and hosted by the Nuclear Technique Laboratory, University of Sciences, Vietnam National University, Ho Chi Minh City. Instructors are senior NPS members including Christian Bohm, Patrick Li Di, Zhi-An Li, Masahiro Nomachi, Martin Puschmann and Stefan Ritt for the lecture, and hands-on experience for students in the field of radiation detectors and their application. The students are selected by personal interviews using face-to-face and Skype interview to assess the students' knowledge level and to get a sense of competency. Students were from several countries in Asia including Vietnam, Japan, Malaysia, Indonesia and China. Future schools are in the planning stages.

ADCOM ACTIONS

It was moved by FinCom and passed that NPSS donate excess new initiatives 2016 funds of $110000 to the Education and supporting students, a target at least $150000. NPSS also plans to create an NPSS e-membership with dues 50% of regular NPSS dues, as with IEEE e-membership. NPSS e-membership be created with dues 50% of regular NPSS dues, as with IEEE e-membership. NPSS e-membership will be available from our schools and technically cosponsored, shall provide free conference registration for two people who are the main contributor to the membership desk, and are not to attend the conference. The conference shall provide a membership desk in a highly trafficked area. This shall be part of every TCS MOU approved by NPSS, and the TC chairs will ensure that this is part of their conferences and so inform the conference chair and committee.

It was moved by FinCom, and passed, that for budgeting purposes 2018 dues shall remain at the current level.

The NPSS AdCom approves support for a 3.5-day international workshop on requirements development for standard space radiation environment models. Support includes $12K to partially cover the cost of the workshop and up to $20K to provide travel support for up to 10 members of the radiation effects community to participate in the workshop. The motion, submitted by the Radiation Effects Committee and supported by FinCom, passed.

AdCom approves the IEEE Technical cosponsorship of the 2017 IP-PAC and SPECT-PAC. The motion was submitted by NVMC.

AdCom approves the new MOU for the APS-CPR, IEEE-PNPS and PAC OC for the PNAC and NA-PAC conferences held in the Americas.

AdCom approves the Technical Cosponsorship of the 2017 International Workshop on Plasma for Cancer Treatment (IWPCT), which will be held in Petro, France on March 27-29, 2017.

AdCom will hold its first meeting of 2017 on March 4 at the DoubleTree by Hilton in St. Augustine, FL. The meeting will be preceded by a retreat.

Albo Larsen, IEEE NPSS Secretary and Newsletter Editor, can be reached by E-mail at a.m.larsen@ieee.org.
Astronomy Department. She first worked on detectors and data analysis as applied to measurements of nuclear reaction cross sections at the Canadian Nuclear Physics Laboratory, TRIUMF and then transitioned to nuclear medicine-based imaging. Since then she has worked in many areas ranging from instrumentation-related topics such as development of data reconstruction and quantification algorithms, motion correction for high-resolution PET data, design and development of a preclinical MR-compatible PET insert, to more applied areas such as development of novel kinetic modeling approaches for PET tracers and performance and interpretation of preclinical and clinical studies. Her publication list includes more than 150 papers and 200 abstracts, she sits on several national and international review committees and is a reviewer for many journals and conferences. She has been attending the IEEE MEC meetings since 1993 and has served on Nuclear Medical and Imaging Sciences Council (NMISC), the Marie-Sklodowska-Curie Award committee, was MIC Program Chair in 2012 and NED/VEC General Chair in 2015.

Non Members can be reached by E-mail at vesna@phas.ubc.ca.

NPSS AdCom New Members

Dennis Youchison’s (MSFT-BMOS) received the B.S., M.S., and Ph.D. degrees in nuclear engineering from the Pennsylvania State University, University Park, PA in 1982, 1984 and 1989, respectively. His dissertation at the Westinghouse R&D Center involved measurements of spallation yields for redeposited graphite and bremsstrahlung-plasma-facing surfaces. From 1990 to 1993, he was an Office of Naval Technology Postdoctoral Fellow at the National Research Laboratory (NRL), Washington D.C. At NRL, he developed plasma diagnostics for electron cyclotron resonance plasma-assisted chemical vapor deposition. During 1993 to 2015, he was a staff member at the Sandia National Laboratories, and appointed a Distinguished Member of the Technical Staff in 2003. He was responsible for high-flux neutron testing and electron-beam thermal processing of materials. Currently, he is a Distinguished Scientist at Oak Ridge National Laboratory in the Fusion and Materials for Nuclear Systems Division. He is the author of over 70 journal papers. He currently holds five U.S. patents and is a licensed professional engineer. His research has focused on the development of materials for extreme environments and the design of plasma-facing components. Dennis served as the general chair for the 22nd Symposium on Fusion Technology (SOFT, 2007) and served three terms as the chair of the Fusion Technology Committee (FTC) on the NPSS AdCom (2010-2012). He also served on the NPSS awards committee and contributed as a Guest Editor to two SOFT Special Issues on Advancements in Plasma Science (2011 and 2013). In addition to being a senior member in IEEE, he is also a member of ASME and AINS.

Steven Sassi received the Laurea degree from the University of Trieste, Italy, in High Energy Physics in 1986 and the Ph.D. degree from the University of British Columbia (UBC), Vancouver, B.C., Canada in Nuclear Physics in 1991. Since 2001 she has been a Faculty member in the UBC Physics and Processing, and Plasma Medicine Journal. He won the inaugural International Society for Plasma Medicine Prize (2010) and the IEEE Nuclear and Plasma Science Society Medallion (2015) for his contributions to biomedical applications of ionized gases and to non-equilibrium gas plasmas, respectively. He is an IEEE Fellow.

Michael Kong, PSAC chair, can be reached by E-mail at mking@iu.edu.

Michael Kong is Batten Endowed Chair in Biomedical and Professor of Electrical Engineering at Old Dominion University. His current interests include low-temperature gas plasmas and their utility in biology and medicine (e.g., disinfection, cancer therapy, and regenerative medicine). He has published over 180 journal papers with some 6,000 citations, and has given over 70 plenary and invited talks at international conferences. Before moving to Old Dominion in 2012, he had been in the UK for 24 years, initially as a Ph.D. student in electrical engineering at the University of Liverpool (1988 – 1992) and then rising through the ranks to become, in 2004, Chair and professor in Biomedical Engineering at Loughborough University. At Loughborough, University, he held leadership positions including Associate Dean and Co-Director of a campus-wide Center for Biological Engineering. He has been active with the Institute for Electrical and Electronic Engineers (IEEE), having chaired the 2012 IEEE International Conference on Plasma Science (ICOPS) in Edinburgh, UK, and served as a Senior Editor of IEEE Transactions on Plasma Science. At present, he is Chair of the Plasma Science and Applications Committee, IEEE Nuclear and Plasma Science Society.

Dr. Kong has been a member of the editorial board for several other scientific journals in the field of gas plasmas, including Plasma Sources Science and Technology, Plasma Chemistry and Plasma

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New AdCom Officers and Members

Continued from PAGE 5

vertical integration of smart-systems. She is on the scientific committee of several international conferences on Radiation Detectors and Instrumentation and is the co-founder of the ERED (European Radiation Detector and Imaging Technology) Network to promote Radiation Imaging Technology research across different fields of application in Europe.

As a member of the NPSS Transnational Committee representing the United Kingdom, she will be the NSS Chair at the NSS-MIC Conference in 2019 and since 2015 she has been an elected member of the NPSS RISC Committee.

Circio Do Wai can be reached by Email at Chris.DoWai@manchester.ac.uk.

Heiko Koerte
Industry Liaison

Heiko Koerte has been with Gesellschaft für Nuklear- und Automatisierungstechnologie mbH (N.A.T.) for more than 23 years and is responsible for the world-wide sales and marketing activities of N.A.T. Before having been appointed VP and Director Sales & Marketing back in 2000 he led Software Development at N.A.T. for more than 10 years. Due to his strong background in engineering he still is personally involved in the definition of all strategic hardware and software products at N.A.T. He holds a diploma degree in Physics from Bonn University in Germany.

N.A.T. was founded in 1990 with the aim of developing high-performance network interfaces for industrial computers. From the beginning the goal has been to provide turn-key solutions such as on an individual combination of hardware and software. Constant growth during the last 26 years and substantial knowledge in networking technologies has brought N.A.T. to the forefront of the embedded communication market. N.A.T. is privately owned and located in Bonn, Germany.

This combination of engineering and business experience makes Heiko the ideal person to fill the new AdCom position of Industry liaison, with the goal of increasing NPSS involvement with and membership from the industries that support our research needs.

Heiko Koerte, Industry Liaison

At the meeting presentations were made to Joaya Dutta who received the 2016 Bruce Hasagawa Medical Imaging Conference Young Investigator award, and to Theodore Hwang who received the 2016 Edward J. Hoffman Medical Imaging Scientist Award, and Simon Cherry who received the 2016 IEEE Marie Sklodowska-Curie Award. Also at the meeting, the student awards were decided and these went to:

- Chen-Ming Chang, Stanford University. First award (only) for Time-over-Threshold for Pulse Shape Discrimination in a Time-of-Flight/Double-Interaction Photon PET Detector.
- Audrey Cobill-Tambere, Université de Sherbrooke. Second award (poster) for Energy Glomeration Using First Emitted Photon Timestamps on Exploratory Study.
- Anna Turko, KU Leuven. Third award (oral) for US Exo and in Vivo Studying Edgeline Imaging and Mesenchymal Phase for Portal Volume Correction in Cardiac PET.
- Cameron Miller, University of Michigan and Loma Linda University. Fourth award (oral) for Scientific disc detection assessment of Monte Carlo and Photon Dose Rates During Proton Therapy.

Congratulations to all our award winners! Please consider nominating worthy colleagues for this year’s Bruce Hasagawa and Ed Hoffman awards. The deadline is 15th of July (see NMISC website for details)

This year’s NSS-MIC meeting will be held in Atlanta, USA, with John Aarsvold General Chair and Lars Fontell, Matthews Supplied Mic Chair and Deputy Chair. For details see the conference website at http://www.nss-mic.org/2017/. Note that this year’s meeting is from 21-28 October and so slightly earlier than in recent years. The 2017 Conference on PET-MRI and SPECT-PET (SMP) will take place between the 29th and 31st of May in Lisbon http://www.psmr2017.pt/. In 2018 the NSS-MIC will be in Sydney, Australia (General Chair Anatoly Rozenfeld, MIC Chair and Deputy Chair Steve Melillo and Tatja Yamaya), and in 2019 it will be held in Manchester, UK (General Chair Paul Marsden, MIC Chair and Deputy Chair Dimitra Darambara and Suleman Surti).

From the beginning of 2017 Emile Roncall from UC Davis has taken over the role of NMISC secretary from Andrew Coetzee, and Viesa Soosi, from UBC, has taken over from Ron Jaszczak as one of our two NMISC AdCom representatives. I look forward to working with Emile and Viesa and welcome them both to Andrew and Ron for all your hard work.

I encourage all of you to volunteer as candidates for being Council members and help in seeing the NMISC membership by gaining experience on matters associated with our community as well as the running of the MIC meeting. Five individuals are elected each year for a three-year term—if you are interested in more detailed information can be found on the NMISC website http://www.nss-mic.org/?gclid=CMaousCmRgMCFQOMH8A7CjDmCE. The new NPSS Journal Transactions on Addiction and Pharma Medical Sciences (TPMS) is now up and running — please consider submitting your latest work at https://mc.manuscriptcentral.com/tjpmrs.

Paul Marsden, NMISC Chair, can be reached at the Division of Imaging Sciences and Biomedical Engineering, King’s College London, St Thomas’ Hospital, London, SE1 7EH. UK. Phone: +44 (0)20 718 83308; Email: paul.marsden@kcl.ac.uk

Nuclear Medical and Imaging Sciences

Paul Marsden
NMISC Chair

The 2016 IEEE NSS Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) was held in the newly completed Conference Centre in Strasbourg, France at the end of October. The meeting was a great success—if you weren’t there you can get an idea of it from this short movie http://www.nss-mic.org/images/mic/nss/mic2016 HSVPE people registered for the meeting overall. For the MIC 564 abstracts were submitted of which 122 and 576 were accepted for oral and poster presentations respectively representing a rejection rate around 11%. A very well-received innovation was the introduction of Scientific Summary Sessions comprising very rapid reviews of all the significant presentations in the main MIC topic areas. Congratulations to Dimitris Viskasila (MIC Program Chair), Suleman Surti (MIC Program Deputy Chair) and everyone else involved for making such an excellent job of the program and putting on such an enjoyable meeting.

Down to Earth

Be not too hasty to trust or to admire the teachers of morality: They discourse like angels but they live like men.

Samuel Johnson
Hugh Barnaby
Class of 2017 IEEE Fellow

Hugh Barnaby is an Emeritus Scientist at NASA's Goddard Space Flight Center (GSFC). She joined NASA in 1992 after working several years on NASA engineering support contracts. Her leadership and technical contributions in the space science and engineering communities have been instrumental in the advancement of the capability to design, build, and operate capable, robust space systems. She was a lead radiation hardness assurance engineer for multiple NASA missions including Mobile Space Telescope instruments, the Microwave Anisotropy Probe, and the Geostationary Operational Environmental Satellites. As a member of NASA's Living With a Star science architecture team, she led collaborations in the space science and engineering communities resulting in high fidelity space radiation climate models and improved space weather forecasting capabilities. In 2010, she was appointed to NASA's Senior Executive Service and was selected as the Chief of GSFC's Electrical Engineering Division where she was responsible for the design and delivery of spacecraft electronic systems and integration and testing for NASA observatories. Her leadership included the successful launch and performance of the Sun Radiation Science Observatory, the Magnetospheric Multiscale (MMS) constellation, the Global Precipitation Monitor observatory, and the Thermal Infrared Sensor instrument on LANSATE-8. In 2014 she was the recipient of GSFC's Robert H. Goddard Award of Merit, the highest individual honor that can be bestowed to a Goddard Space Flight Center employee. She served as the NPS Society's President in 2013 and 2014 and is currently the Executive Vice-chair of the Radiation Effects Technical committee. She has held several positions on conference committees for Radiation Effects including general conference chair, technical program chair, guest editor, and short course presenter.

Citation: For research of radiation effects in bipolar junction transistors.

Janet Barth
Class of 2017 IEEE Fellow

Janet Barth is a Distinguished Scientist at NASA's Goddard Space Flight Center (GSFC). She joined NASA in 1992 after working several years on NASA engineering support contracts. Her leadership and technical contributions in the space science and engineering communities have been instrumental in the advancement of the capability to design, build, and operate capable, robust space systems. She was a lead radiation hardness assurance engineer for multiple NASA missions including Mobile Space Telescope instruments, the Microwave Anisotropy Probe, and the Geostationary Operational Environmental Satellites. As a member of NASA's Living With a Star science architecture team, she led collaborations in the space science and engineering communities resulting in high fidelity space radiation climate models and improved space weather forecasting capabilities. In 2010, she was appointed to NASA's Senior Executive Service and was selected as the Chief of GSFC's Electrical Engineering Division where she was responsible for the design and delivery of spacecraft electronic systems and integration and testing for NASA observatories. Her leadership included the successful launch and performance of the Sun Radiation Science Observatory, the Magnetospheric Multiscale (MMS) constellation, the Global Precipitation Monitor observatory, and the Thermal Infrared Sensor instrument on LANSATE-8. In 2014 she was the recipient of GSFC's Robert H. Goddard Award of Merit, the highest individual honor that can be bestowed to a Goddard Space Flight Center employee. She served as the NPS Society's President in 2013 and 2014 and is currently the Executive Vice-chair of the Radiation Effects Technical committee. She has held several positions on conference committees for Radiation Effects including general conference chair, technical program chair, guest editor, and short course presenter.

Citation: For research of radiation effects in bipolar junction transistors.

Andreas Neuber
Class of 2017 IEEE Fellow

Andreas Neuber is a Distinguished Member of Technical Staff at Sandia National Laboratories in Livermore, California USA. He received the B.S. degree in Computer Engineering from the University of California at Berkeley, USA and the M.S. and Ph.D. degrees in electrical engineering from Stanford University, Stanford, CA, in 1991 and 1994, respectively.

His research at Sandia includes the development of theoretical and computational tools for modeling radiation effects in electronic components and materials. His work has focused on modeling and characterizing the behavior of high-temperature electronic components and materials, with a focus on the development of models for radiation-induced degradation in electronic devices.

Citation: For contributions to free-electron lasers.
Continued from PAGE 7

Citation: For groundbreaking and influential contributions to the field of plasma science, including: diagnostics, waves, plasma-surface interactions, beam instabilities, ionospheric plasmas, magnetospheric science and novel microwave radiation sources.

**AMANDA M. LOVELESS WINS OUTSTANDING STUDENT PAPER AWARD AT ICOPS 2016**

Amanda Loveless, Ph.D. student at Purdue University in the Department of Nuclear Engineering under the tutelage of Prof. Allen Garner, received first place for the NPSS Outstanding Student Paper for her presentation entitled Generalization of Scaling Laws for Gas Breakdown to Account for Pressure at the 2016 ICOPS Awards in Banff.

The first Runner Up for the NPSS Outstanding Student Paper was Xi Tang for his work on Recent Advances in Theory and Experiment of Metamaterial-based High Power Radiation Devices, while the final three of the top five in the Student Paper Award competition, the CRC Book Prize winners, were Vighneswara Siva Santosh K Kondeti, David Yager-Evans, and Brett Scherer.

A summary of Loveless’ work, to be published in IEEE Transactions on Plasma Science follows.

Breakdown laws fail to predict accurately the breakdown voltage, \( V_b \), for microscale gaps. Loveless and Garner take laws previously used to model atmospheric argon discharges and extend them to 100 nm to 30 \( \mu \)m gaps. Paschen’s Law predicts the breakdown voltage between two electrodes via Townsend discharge. Where the Paschen Law is written as:

\[
V_b = \frac{B p d}{\ln(A) - \ln(1 - 1/e)}
\]

where \( p \) is gas pressure, \( d \) is electrode gap distance, \( A \) and \( B \) are material constants, and \( r_e \) is the secondary electron emission coefficient.

This equation highlights the dependence of the breakdown voltage, \( V_b \), on \( p \) and \( d \). Boyle and Kaulik have shown that, while accurate in macroscopic systems, Paschen’s Law fails to accurately describe the breakdown of the scales applicable to microelectronic, and other such microscale, systems [4].

When looking at these microscale systems, the field emission effects, predicted by Fowler and Nordheim [16], but neglected in this form for Law, must be considered [19]. In the traditional PL model, decreased gap length is equated to fewer opportunities for ionizing collisions, with the extreme being that electrons can transit the gap without ever having ionized gas molecules. Thus, PL would predict that smaller \( p_d \) lead to larger \( V_b \). This falls apart when considering large enough electric fields in which field emission, or electrons tunneling from the cathode, occurs. The smaller the gap, the larger the electric field is for a given gap voltage. Similarly, the smaller the gap length, the more likely it is for positive ions to collide with the cathode prior to recombination, thus freeing more electrons. It is this combination of the excess electrons from field emission and the excess of electrons from the positive ions colliding with the cathode that cause a decrease in breakdown voltage at small distances [20], contrary to PL predictions.

“Modified Paschen curves” have been created which include both the Townsend effects and field emission effects [19, 20, 27-33]. Loveless and Allen improve upon these ideas, adding the dependence on experimentally determined fitting parameters and the need for numerical solutions through “an asymptotic analysis these modified Paschen’s models.” From this, they derive the analytic expressions for atmospheric breakdown voltages as a function of gap distance in argon [34].

The Loveless model has been demonstrated to accurately predict breakdown voltages in nitrogen, argon, helium, and oxygen through the use of a fitting parameter, \( p \). These models are substantially through comparison with numerical solutions, analytic equations, PIC simulations, and experimental data.

See IEEE Xplore for a full list of references and the full paper, yet to be published, for the full list.

To enter the Student Paper Award competition, candidates should check the box for the Best Student Paper Award during abstract submission and advisors should promptly submit a letter of support indicating that the work is primarily that of the student.

**RADIATION INSTRUMENTATION COMMITTEE REPORT**

I had the honor to be appointed for 2016 as RISC Honors and Awards Subcommittee Chairperson and I would like to give you a brief report of this year’s activities.

The RISC had to assign two prestigious awards in 2016: the Radiation Instrumentation Early Career Award (RIECA) and the Glenn F. Knoll Radiation Instrumentation Outstanding Achievement Award (ROAA).

First of all we decided to publish on the RITC webpage the Committee members’ names and the ways to manage and solve Conflicts of Interest that might arise in order to increase the perception on transparency and conflict-of-interest management. Committee members cannot nominate anybody for RI awards. If a committee member is asked to write a reference for a candidate, that member will then recuse him/her self from participating in candidate evaluation.

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. For 2016 the RIECA Committee members were Jane Bell (Oak Ridge National Laboratory, USA), Gaknlan De Geronimo (at that time at Brookhaven National Laboratory, USA), Gregzegorz Deptuch (Fermi National Accelerator Laboratory, USA), Lorenzo Fabri (Oak Ridge National Laboratory, USA), Stuart Kleinfeld (University of California, Irvine, USA), Chiara Guazzoni (Politecnico di Milano & INP, Italy) and Richard Larosa (Massachusetts Institute of Technology, USA).

The Committee received seven new nominations for 2016 for the RIECA as well as the top two candidates (runner-up) from the 2015 selection process for reconsideration. Applications were carefully evaluated by the Committee. 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 for this year (applications of extremely high profile) for the 2017 edition of the award and the nominators will be asked to update their nomination well in advance of the 2017 deadline.

The 2016 Radiation Instrumentation Early Career Award was presented on October 31st during the opening ceremony of the 2016 Nucles Science Symposium to Marc-André Tétrault, nominated by Réjean Fontaine (professor at the Université de Sherbrooke, Canada) for contributions to the field of real time radiation instrumentation data acquisition systems applied to Pulsed Emission Tomography. In addition to the certificate and the plaque, the awardee received a copy of Glenn Knoll’s textbook donated by Bill Moss and dedicated to him by Glenn Knoll. Marc-André, who received his Ph.D. in 2016 from the Université de Sherbrooke, is author of 24 peer-reviewed publications and 27 conference presentations. His Ph.D. research focuses on a 3D stacked heterogeneous digital SPM module for time of flight PET. He was responsible for coordinating the 3D integration between the three tiers and designing...
the real-time digital data acquisition system (DAQ). The chip design took advantage of the 3D vertical hierarchy to reduce the timing jitter caused by the layout of the trigger and, included a three-layer DAQ system directly under the detector. The DAQ also included a novel dark count discrimination circuit. To Marc-Antoine all our congratulations and good luck for your new post doc position at Harvard University.

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 $5,000 and an engraved plaque. For 2016 the RIDA Committee Members were Zane Bold (Oak Ridge National Laboratory, USA), Chiara Guazzoni (Politecnico di Milano & INFN, Italy), Richard Lanza (Massachusetts Institute of Technology, USA), Paul LeCoeur (CERN, Switzerland) and Veljko Radičević (Brookhaven National Laboratory, USA).

The Committee received three new nominations for 2016 and included the top two runner-ups from 2015 for reconsideration. Applications were carefully studied and a final decision was made. The following is the list of the 2016 RIDA winners:

- **Chom Thakur** (University of Chicago, USA) for the Outstanding Achievement Award “for outstanding contributions to the development of silicon pixel vertex detectors.
- **Ladbury, J.A. Pellish, M.J. Campola, and K.A. LaBel**.

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**CHAPTERS**

The IEEE is organized around regional activities (Sections) as well as technical activities (Societies and Councils). At the intersection of these two are Chapters and Student Chapters. Chapters are local units of the IEEE that are part of their Region and Section (or sometimes more than one Section), but are affiliated with one or more IEEE societies, while Student Chapters are student-run organizations that are affiliated with one or more Societies but are formed within an IEEE university student Branch. The purpose of both kinds of chapters is to serve their members by sponsoring local activities that are linked to the technical areas of interest of their members, such as lectures with guest speakers, workshops, and social activities such as dinner meetings that provide opportunities for networking.

In addition, chapters provide opportunities for leadership training. The NPSS currently has 22 active chapters and joint chapters around the world, including two student branch chapters. Of these, 8 are in the United States (Regions 1-6), 2 in Canada (Region 7), 8 in Europe, including eastern Russia, Africa and the Middle East (Region 8), and 4 in Asia (Region 10). Their locations are shown on the accompanying map. The two newest are a chapter in Southeastern Michigan and a student branch chapter at the Vellore Institute of Technology in Tamil Nadu, India, both of which were established in 2015. As a matter of policy, the NPSS provides both technical support to its chapters, via our active Distinguished Lecturers’ program, as well as annual financial support, and will provide active assistance in the formation of new chapters, wherever there is interest and enough NPSS members to support a local chapter. There are currently efforts under way to form new chapters in China and the United Kingdom, and new student chapters in France and Costa Rica. Information on our chapters program can be found at http://inverse.ieee.org/chapters/.

For additional information, or if you are interested in establishing a new NPSS chapter, please contact Steven Gold, the NPSS Chapter Coordinator, at steve@ieee.org

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**2016 IEEE NUCLEAR AND SPACE RADIATION EFFECTS CONFERENCE AWARDS**

It is a longstanding tradition of the IEEE Nuclear and Space Radiation Effects Conference to honor the Outstanding Conference Paper and the Outstanding Data Workshop Presentation. In recent years recognition has also been given to the best paper presented and first-authored by an IEEE student member. The awards process not only recognizes high quality and important work, but also encourages all 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 following 2016 NSRE Conference Awards. Their awards will be presented at the 2017 Conference.

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**OUTSTANDING CONFERENCE PAPER**


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**OUTSTANDING STUDENT PAPER**


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**OUTSTANDING DATA WORKSHOP PRESENTATION**


For information on Radiation Effects awards please contact Allan Johnston, Chair, Radiation Effects Technical Committee at allanjohnston25@gmail.com.

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**FUNCTIONAL COMMITTEES**

The NPSS Chapters and Student Chapters are student-run organizations that are affiliated with one or more Societies but are formed within an IEEE university student Branch. The purpose of both kinds of chapters is to serve their members by sponsoring local activities that are linked to the technical areas of interest of their members, such as lectures with guest speakers, workshops, and social activities such as dinner meetings that provide opportunities for networking. In addition, chapters provide opportunities for leadership training. The NPSS currently has 22 active chapters and joint chapters around the world, including two student branch chapters. Of these, 8 are in the United States (Regions 1-6), 2 in Canada (Region 7), 8 in Europe, including eastern Russia, Africa and the Middle East (Region 8), and 4 in Asia (Region 10). Their locations are shown on the accompanying map. The two newest are a chapter in Southeastern Michigan and a student branch chapter at the Vellore Institute of Technology in Tamil Nadu, India, both of which were established in 2015. As a matter of policy, the NPSS provides both technical support to its chapters, via our active Distinguished Lecturers’ program, as well as annual financial support, and will provide active assistance in the formation of new chapters, wherever there is interest and enough NPSS members to support a local chapter. There are currently efforts under way to form new chapters in China and the United Kingdom, and new student chapters in France and Costa Rica. Information on our chapters program can be found at http://inverse.ieee.org/chapters/.

For additional information, or if you are interested in establishing a new NPSS chapter, please contact Steven Gold, the NPSS Chapter Coordinator, at steve@ieee.org

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**Chris Damerell** receives the 2016 Glenn F. Knoll Radiation Instrumentation Outstanding Achievement Award “for outstanding contributions to the development of silicon pixel vertex detectors, in particular Charge Coupled Devices for high energy physics experiments and other fields.” From left to right: Chiara Guazzoni, Chris Damerell, Susanne Kuehn, Eckhard Elsen.
The Alexandria Student Branch Chapter has recently organized two events that targeted the students of the Nuclear & Radiation engineering department in Alexandria University; the first one is a short course named An Overview of Nuclear Reactor Calculations and the second one is a session entitled Understand the Roadmaps. Dr. Abdelfattah Soliman, an assistant professor of Nuclear Engineering, King Abdulaziz University, was our guest presenter for the two events.

The main focus of the short course was to present some parts of the framework of nuclear reactor design. It was oriented towards the technical and professional work that is being done in industry and research institutes. Knowing that our target audience was freshmen students who had only taken a basic “Introduction to Nuclear Engineering” course and that the topic was somewhat advanced it was necessary to introduce some concepts and basics to the audience to help them understand the engineering problems faced during the week.

The short course covered topics such as: Reactor Criticality, Nuclear Data, Benchmarking, Fuel Management, Reactor Thermal Hydraulics and Reactor Design. It was a very beneficial course that we in NPSS Alex SC were very glad to organize.

Our second event “Understand the Roadmaps” was previously organized in 2013 and we were more than happy to present it again to a new audience.

The roadmap's purpose is to connect all the 56 courses in the curriculum of the Nuclear & Radiation Engineering Department, Alexandria University. The nuclear engineering major includes courses from diverse disciplines such as Electrical, Mechanical and Thermal engineering. All these courses with their diversities form a road map towards the many applications and technologies in the nuclear field. This seminar helps the students to link those courses together and understand the object of each course.

In 2015 we started the NPSS open courseware project believing in the idea of free and open educational sharing. The graphics committee of NPSS Alex SC is doing a great job to videotape and edit the lectures to make them available for everyone. We've already published three courses under this project on YouTube. The “Understand the Roadmap” seminar was also published recently. And soon our recent short course An Overview of Nuclear Reactors Calculation will be available.

Haidy Mohamed, the secretary of the Alexandria Student Branch Chapter can be reached by E-mail at haidymohammed94@gmail.com

Haidy Mohamed
Secretary Alex SC

LIMA ACCORD SIGNED BY SEVEN LATIN AMERICAN AND CARIBBEAN ACCREDITING BODIES

Two years of work culminated in the signing of the “Lima Accord” on 6th September 2016.

Representatives of the accrediting agencies and IEEE gathered in Lima to officially launch this international accreditation agreement between the bodies responsible for accreditation in Latin America and the Caribbean (IEEE Region 9).

Accords are mutual recognition agreements in which two or more accrediting agencies agree to provide equal recognition to all programs accredited separately by each one of the entities who are parties to the accord. The objective of these accords is to ensure that degrees of graduates from programs of one county or region are fully recognized in another.

The signatories of the Lima Accord included the following accreditation agencies:

- Agencia Acreditadora Colegio de Ingenieros de Chile (Chile)
- Agencia de Acreditacion de Programas de Ingenieria y de Arquitectura (Costa Rica)
- Caribbean Accreditation Council of Engineering and Technology (CACET)

The objectives of the Lima Accord included the following accreditation agencies:

Liaison Reports
EDUCATIONAL ACTIVITIES BOARD

Ed Schamiloglu
NPSS Liaison to EAB

IEEE EDUCATIONAL ACTIVITIES IS SUPPORTING A NEW SOCIAL MEDIA CAMPAIGN TO RECOGNIZE PRE-UNIVERSITY EDUCATORS WHO HAVE CREATIVELY IMPROVED ANY OF THE 130 ENGINEERING, COMPUTER, AND TECHNOLOGY LESSON PLANS FOUND AT TRYENGINEERING.ORG, TRYCOMPUTING.ORG, OR TRYTECHNOLOGY.ORG.

These lesson plans have been chosen by educators from around the world, and the winners will receive a prize from IEEE Educational Activities. Winners will receive a $100 gift card, a personalized Thank You letter from IEEE Educational Activities, and a chance to present their lesson plan at the 2018 IEEE International Conference on Engineering Education.

Entries must be submitted by 15 October 2016. The winners will be announced in early November 2016. More information can be found at www.tryengineering.org/winnable-lesson-plans.
**NEW IEEEELSSONS INACTION CAMPAIGN HIGHLIGHTS PRE-UNIVERSITY STEM EDUCATION**

IEEE Educational Activities recently launched a new social media campaign to excite and inspire pre-university STEM educators about their implementation of the free lesson plans that are available at TryEngineering.org, TryComputing.org, and TryNano.org. The goal of the new IEEELessons_inAction (go to TryEngineering.org to view) campaign is to encourage educators to share photos from their classrooms when creatively implementing any of IEEE’s 130+ engineering, computing, and technology lesson plans.

Additional information about the IEEELessons_inAction campaign and promotional materials can be found at http://bit.ly/IEEELessons_inAction.

**CONTINUING EDUCATION**

More than 120,000 learners have registered for IEEE’s Massive, Open, Online Courses (MOOCs) since the partnership with learning provider edX was established in 2014. Recent courses on smart grid and smart cities have attracted learners of all ages from all around the world. Look for content on the National Electrical Safety Code® (NESC®), cybersecurity and more in later 2016 and early 2017.

Meanwhile, the learning library—the online learning resource that delivers more than 400 courses in core and emerging technologies—released over a dozen new courses on hot topics in cybersecurity, the Internet of Things, ethical hacking and more. Through the IEEE Certificates Program, Educational Activities works with Societies, Sections, Chapters, and other IEEE units to deliver certificates awarding Continuing Education Units (CEUs) and Professional Development Hours (PDHs), as well as certificates of participation, directly to attendees of their educational events via email.

Edith Schumacher, IEEE N3XT liaison to EAB, can be reached by E-mail at edb@iastm.edu.

**THE CAREER GAME CHEAT CODE: IEEE YOUNG PROFESSIONALS**

![Image](image1.png)

By: Mario Milecivic
Past IEEE YP Chair

Why do young people come to the IEEE? For those in academia, the answer is simple: “I need to publish papers in order to graduate.” But for those working as engineers or scientists in industry, the decision to join is typically much more personal and focused on long-term career development. As a member of the IEEE, you are part of a global network of over 400,000 highly skilled and technically qualified individuals that can help influence and shape your development as a young engineer, scientist, or associate in a related field. So regardless of whether you wish to pursue academia or move into industry, the IEEE is here to serve as your career backbone.

But how? There’s so much going on in the IEEE. For newcomers, the learning curve can be overwhelming. The IEEE runs over 1,500 technical conferences annually, the IEEE Xplore Digital Library has over 4 Million indexed technical publications, there are over 1,400 active working groups developing IEEE Standards, and over 25 meetings are held each day in local chapters, branches, and sections. The good news is that there’s no shortage of activity, but the question many young members ask is: how exactly does the IEEE advance my career? This is where the IEEE Young Professionals program comes in.

The newly rebranded IEEE Young Professionals program now focuses primarily on providing young members with meaningful professional networking and mentorship opportunities, as well as opportunities to stay technically relevant and develop new skills.

**PROFESSIONAL NETWORKING AND MENTORSHIP**

Heading to an IEEE conference soon? Be sure to check out the IEEE Young Professionals program part of the conference agenda. Many flagship IEEE conferences now feature a special on-site event for IEEE Young Professionals members such as a career panel, hackathon, or “breakfast with mentors,” as well as an affiliate meetup at a nearby pub or restaurant where you can mix and mingle with local IEEE members. What better way to expand your professional network than to meet new IEEE members in a new city and in a relaxed environment?

Earlier this year, the IEEE Young Professionals team from the IEEE Circuits and Systems Society hosted a 2-hour tech-entrepreneurship panel for students and young professionals during their flagship 2016 IEEE International Symposium on Circuits and Systems in Montreal, Canada. Immediately following the on-site event, participants were invited to an informal evening reception at a beer hall across the street where they had the opportunity to network among each other, as well as with IEEE members from the local IEEE Montreal Section, thanks to the coordinated efforts of the IEEE Montreal Young Professionals Affinity Group.

On the other side of the continent, the IEEE Young Professionals team from the IEEE Microwave Theory and Techniques Society organized a career panel with experts from academia and industry during the 2016 IEEE International Microwave Symposium in San Francisco, California. Naturally, the event was followed by an evening reception in a nearby Billard hall with local IEEE members from the San Francisco Section.

These are two of the most recent meetups held at Society conferences in 2016; however, there’s action to be found in almost all of the IEEE Technical Societies, including Photonics, ComSoc, EDS, DEIS, NPSS, SSCS, and EMC. The IEEE Consumer Electronics Society will be hosting a special IEEE Young Professionals program during the annual IEEE International Conference on Consumer Electronics, which coincides with the world-famous Consumer Electronics Show in Las Vegas, Nevada.

While these large-scale events typically draw over 200 participants, there are other ways to connect with IEEE members and explore professional networking and mentorship opportunities. Get in touch with the local IEEE Young Professionals Affinity Group in your IEEE Section to learn more about these opportunities.

**IEEE Young Professional meetups bring together IEEE members from around the world**

**IEEE N3XT global entrepreneurship summit**

Diverse topics presented during IEEE Young Professionals webinar series

**IEEE congresses provide career and leadership training to IEEE volunteers**

**NO JOKER**

There is no objection to his [Gladrstone’s] always having the ace of trumps up his sleeve, but only to his pretence that God had put it there.

Henry Labouchere (paraphrase)
The Data Acquisition System of the KOTO Experiment

We use high-intensity proton beams provided by the J-PARC accelerator to create Kaons. In future steps of the experiment, we plan to increase the beam intensity to achieve the event sensitivity at the Standard Model level. The first KOTO experiment run was conducted in May 2015, using 24 kW beam power. The beam intensity increased to 41 kW for the 2015 and 2016 experiment runs. To observe this one out of 30 billion rare decays, the balance of the data acquisition system is critical. A data acquisition system capable of handling high trigger rates and performing complex event selections was implemented.

A schematic of the data acquisition chain is shown in Figure 1. The KOTO data acquisition system uses 125 MHz and 500 MHz ADCs to digitize detector waveform signals from 4000 channels in order to create a high livetime (live data) data acquisition system. Detector waveform signals from 4000 channels are digitized by the ADCs into 14 bits and 12 bits, using lossless data compression during the experiment runs from 2015 to 2016, as shown in Fig. 2. To achieve the goal of the KOTO experiment run in May 2015. These upgrades include the usage of lossless data compression inside the ADC and the development of a complete new computer cluster trigger in order to create a high livetime (live data) data acquisition system.

Detector waveform signals from 4000 channels are digitized by the ADCs into 14 bits and 12 bits, using lossless data compression during the experiment runs from 2015 to 2016, as shown in Fig. 2. To achieve the goal of the KOTO experiment run in May 2015. These upgrades include the usage of lossless data compression inside the ADC and the development of a complete new computer cluster trigger in order to create a high livetime (live data) data acquisition system.

To assemble the event fragments scattered among all the trigger modules, Level 3 (L3) software trigger receives the data from each L2 board using 1 Gbps Ethernet connections and builds complete events using an Infiniband switch. The L3 trigger system is a computer cluster made of a computer head node and 47 computer worker nodes. Each has a 10 Gbps Infiniband connection to the switch. The worker nodes are divided into two groups (Type 1 and Type 2) for different jobs. Type 1 nodes receive event fragments from the L2 trigger and send them to the corresponding Type 2 nodes via the Infiniband for event building. Type 2 nodes collect all the event fragments from the Type 1 nodes and construct complete events. At this point, Type 2 nodes can uncompress the data for online data analysis, and then re-compress the data for storage.

The current data acquisition successfully ran with up to 80% livetime without the ADC lossless data compression and up to 95% with the ADC lossless compression during the experiment runs from 2015 to 2016, as shown in Fig. 2. To achieve the goal of the KOTO experiment, we plan to increase the beam intensity beyond 50 kW. To maintain high data acquisition livetime and efficient event selection, we are developing the new L2 hardware trigger with the RCE Platform Technology (RPT) [4]. This will allow us to move the event building process upstream, enhance the flexibility of the event selection, and allocate more online data analysis resources in the L3 trigger. We will continue making improvements to the system to gather more data and hope to measure the decay soon.
The 2016 International School in Real-Time Systems
Ho Chi Minh City, Vietnam

At the very successful Real-Time School held in Osaka in 2014, the idea was born to bring a similar school to Vietnam in 2016. This is part of a larger campaign to increase the interest in Nuclear and Plasma Sciences (and the IEEE in general) in Asia. The gives young students a chance to participate in relatively advanced lab exercises and exposure to international lecturers in an informal setting.

Masaharu Nomachi, the chair of both the Nara Real-Time Conference and the Osaka school, and Võ Hồng Hải from the Ho Chi Minh City University of Science took the lead in organizing and setting up the 2016 school, which took place July 18th-26th. The school was hosted by the University’s Vice President Chau Van Tao, with the Head of the Nuclear Technique Lab, Truong Thi Hong Loan, as chair, and Hải, Lê Công Hảo and Tuyết Trần Kim as local organizers.

Twenty students from Vietnam, Malaysia, China, Japan, and other Asian countries were selected by their applications and through online interviews. The school began at the University campus, where the lab courses were held, and moved to the City close to the Nuclear Physics Lab for the last three days. All students and lecturers/instructors stayed at the same place - in the student dorms on campus (and at the same hotel later). Good food and a nice community area created a very informal atmosphere. Discussions and questions would often continue until late at night. The days were divided between lectures and lab exercises led by Christian Bohm, Stefan Ritt, Patrick Le Dû, Masaharu Nomachi, Igarashi Youichi, Zhen-An Liu, and article author Martin Purschke. The school presented a diverse set of practical exercises, such as time-of-flight measurements, High Voltage slow controls, FPGA programming, and a light sensor readout. The lectures covered data acquisition technologies and various readout techniques, the LHC and other physics programs, interactions with computers, networking, and many other topics from the real-time arena.

While the students learned about real-time technologies, we were exposed to the wonderful Vietnamese culture and also the local cuisine (and some exotic fruits). The local Vietnamese students also taught us how to properly cross a busy street swarming with motor scooters without accident, and many other aspects of Vietnamese daily life. The school excursion went to the Mekong River, where we made several stops, taking boats of various sizes, with good food, performances, and a glimpse of life in Vietnam.

The school enjoyed considerable support from the NPSS Distinguished Lecturers program, and in part from the lecturers’ institutes funding the trips and also supplying some material. The best reward for us was the overwhelmingly positive feedback from the students, many of whom were exposed to reading out and analyzing data for the first time.

For additional information contact Martin Purschke, chair of the CANPS TC by E-mail at Purschke@bnl.gov.
The International Workshop on Plasma for Cancer Treatment (IWPCT) is an international workshop that focuses on basic and clinical research into the interaction of low temperature plasma (LTP) with cancer cells and tumors. It was founded in 2014 by Prof. Michael Keidar (Tel-Aviv University) and Prof. M. Laroussi (George Washington University). The second workshop, IWPCT-2, was held in March 2015 in Nagoya, Japan under the co-chairmanship of Prof. Masaru Hori (Nagoya University). IWPCT-3 was held again in Washington DC in April 2016 under the co-chairmanship of Dr. M. Keidar (Tel-Aviv University) and Dr. M. Laroussi (George Washington University). The fourth workshop, IWPCT-4, will be held March 27th–29th, 2017 at the Institute of Physics in Paris, France, under the co-chairmanship of Prof. Dejan S. Simovic (University of the South Pacific) and Dr. Pierre-Marie Girard (Institut Curie). IWPCT-4 is technically co-sponsored by the IEEE-NPSS and papers based on the oral talks given at the workshop will appear in a special issue of the newly established NPSS medical journal, the IEEE Journal on Innovation in Medicine and Science (IEM). The guest editors of this special issue are Mountani, Laroussi, Keidar, and David Graves.

The application of LTP in the field of oncology is a topic of growing importance within the discipline of Plasma Medicine. Plasma Medicine is an interdisciplinary field of research that emerged in the mid-1990s when seminal investigations showed that LTP can effectively inactivate various bacterial genera [1][2]. This biological application attracted the attention of the Physics and Electronics Directorate of the US Air Force Office of Scientific Research (AFOSR) which saw the potential of using such plasmas to decontaminate/textile fabrics and plastic surfaces and to treat suture wounds for disinfection and to accelerate the wound healing process. Subsequently the AFOSR funded proof of principle research work that lasted for more than a decade. Also, in the late 1990s, experiments conducted in Russia showed that plasma-generated nitric oxide (NO) plays a crucial role to enhance phagocytosis and accelerate the proliferation of endothelial cells, showing that plasma could indeed assist the wound-healing process [5]. Furthermore and in the early 2000s researchers from the Netherlands reported that low-temperature plasma can be used to detach mammalian cells without causing necrosis and under some conditions can lead to programmed cell death (apoptosis) [6]. These early efforts conducted in the USA, Russia, and the Netherlands led to the foundation of a novel multidisciplinary research field, the biomedical applications of low-temperature plasma, or plasma medicine as it is known today.

In the last decade several investigations reported in various published studies that low-temperature plasmas can destroy cancerous cells. It is into this era of science that LTP is able to provide a solution. The overall effectiveness of LTP has been shown to be superior to other treatment modalities and in some cases even to surgery.

Figure 2 is a timeline showing some of the most important milestones in the development of the field of plasma medicine.

**REFERENCES**


Obituaries

Emilio Gatti (1922–2016): A Mentor, A Role Model, A Great Man

Emilio Gatti graduated in Ingegneria Elettronomica (Electrical Engineering)—no Electronic track was available in Italy at that time and later on Emilio contributed to its foundation—at the University of Padua in 1946—although he was eager to study physics, he enrolled in an engineering track in order to follow his father’s advice about ease in securing a job—and he was able to focus on electronics the year after.

He began his scientific activity in Nuclear Electronics in 1948 at the Centre for Information Study CISE in Milano, Italy. He then became Adjunct Professor in 1951 at the Politecnico di Milano, Italy and obtained a lecturing post in 1955. In 1957 he became full professor at Politecnico di Milano where he taught up to his retirement in 1997, becoming Emeritus in 1998.

Every autumn for 30 years Emilio used to visit, since 1975, the Instrumentation Division of BNL, as Senior Visiting Scientist collaborating with Vellio Radeka and the late Pavel Rohal.

On July 9th, 2016 Emilio Gatti passed away. He was born in Torino on March 18th, 1922.

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He had a lifelong association with INFN that he contributed to found in 1951.

He became an IEEE Fellow in 1973, received the IEEE Centennial Medal in 1988 and the IEEE Radiation Instrumentation Outstanding Achievement Award in 2004. As a member of the Italian Accademia Nazionale delle Scienze since 1983, he received, in 1985, the Feltrinelli award and the Gold Medal of the President of the Italian Republic.

In 1995 he was able to make his dream a reality when he was awarded a Laura Horning Caiafa in Physics by the University of Milano, Italy.

It is impossible to do justice in a few words to all Gatti’s achievements and inventions. Among his most brilliant achievements one which has a revolutionary role, is the idea of a capacitive feedback to stabilize the input charge-to-output voltage transfer function to perform minimum noise measurements of the charge deposited in radiation detectors (at the time ionization chambers). This idea is the basis of the charge preamplifier that nowadays is the one and only solution to readout radiation detectors.

Emilio introduced and patented the sliding-scale technique to improve the nonlinear sensitivity in ADC’s. ADC’s based on this approach were recognized as a significant Italian contribution to the Mars 96 mission. An ADC based on his sliding-scale principle was employed in the APS contained in the Pathfinder robot. The idea of the sliding scale was also applied in the instrumentation on board the Pathfinder unit.

Starting from his earliest experiences with the electronics for radiation detectors, Emilio was attracted by the investigation of the limitations to the accuracy of detector measurements set by the stochastic noise in electron devices and circuits. This interest continued throughout his entire professional life leading to relevant studies on optimum filtering that resulted in a lengthy monograph (Prossedi, the signal from solid-state detectors, in elementary-particle physics) written together with his late friend and colleague Franco Manfredi (see below), who unfortunately passed away on December 5th, 1995. The monograph was published in 1966 in “La Rivista del Nuovo Cimento.”

Last but not least, in the field of semiconductor radiation detectors, Emilio, together with his late friend and colleague Pavel Rohal (Brno, Brno University National Laboratory, USA) created a widely acknowledged revolution: the Semiconductor Drift Chamber, then called the Silicon Drift Detector. For a long time a semiconductor equivalent to a gas drift chamber for particle tracking was envisioned. The base of the invention of the Silicon Drift Detector was the search for a way to fully deplete a semiconductor bulk in a small contact. Emilio was looking for a way to fully deplete a semiconductor bulk in order to be able to build a very high value resistance for applications in low-noise frontend electronics. In the autumn of 1982 at BNL, he presented the concept for a fully depleted Charge Coupled Device. In the same period Pavel Rohal, at that time a physicist in BNL’s Physics Department, was exploring the way to overcome the limitations of bunch channel CDs, which had, at that time, been used to be used for position tracking in particle detectors.

The basic idea of the sideward depletion—the revolutionary concept at the basis of the Silicon Drift Detector and of related devices—is to fully deplete the semiconductor substrate—in the most natural way—through a point-like “virtual contact,” as it is called in the original paper. As a consequence of having a rectifying junction on both sides of the water, full depletions were achieved with only a quarter of the bias necessary for standard pin diodes. The more impressive consequences, however, was on the capacitance of the virtual contact. In order to provide experimental evidence of the sideward depletion mechanism they decided to build a test silicon structure. H. Kroner (BNL) provided the high-purity silicon crystal and H. R. Beuttenmuller, then an Instrumentation technical associate at BNL, fabricated the test device. The device was created in two days, and provided the desired experimental evidence. The problem to be solved was then to avoid the instability of the fully depleted water, against the thermal variation of generation-hole pairs. In other words, the question still open was how to transport the signal electrons toward the collecting electrode. Emilio and Pavel collaborated energetically for four straight days and they originated three new detector configurations, described in their original paper. The idea of Pavel was then to superpose to the depletion field an external electrostatic field. In this way the potential “gutter” that is formed in the semiconductor volume is tilted so that the electrons generated by radiation interaction are transported from the position of the generation to the anode. “A time delay between the passage of the fast particle and the signal at the anode is due to the drift of electrons. The measure of this time delay gives the measure of the distance between the position of the fast particle and the position of the anode in a similar manner to a gas drift chamber.” The Silicon Drift Detector was born.

Emilio was a great man, a gifted teacher and a passionate and brilliant scientist. With a multifaceted and original intelligence coupled with a deep and strong knowledge of mathematics he served as a mentor and role model for generations of students and colleagues. He was able to concentrate so much on his studies and notes—that I remember one day in his office in the late 1990s—even on a bookcase occupying the entire wall of the office on the top floor falling down full of books—was not able to distract him from the paper he was writing. On the other side he was able to pay attention to every single person’s comments. His legacy is the most precious gift for all of us: his simplicity, his kindness and his habit of sharing scientific ideas and results.

We will miss him forever. As Vellio Radeka said, “Emilio’s passing, preceded by Franco (Manfredi), marks the end of an era.”

This Workshop summary was prepared by Chiara Guazzoni who can be reached by E-mail at Chiara.Guazzoni@mi.infn.it

This article was prepared by Lodovico Ratti who can be reached by E-mail at Lodovico.Ratti@mi.infn.it

The workshop participants under Alessandro Volta statue in one of the courtyards of the University of Pavia.

Detected Signals into the Noise:

Remembering the Life and Work of Franco Manfredi

Franco Manfredi passed away at the beginning of December 2015 in his home in Capogno, in the Italian Alps. On the 5th of December 2016 a workshop was held in Pavia, Italy, to remember his life and scientific work.

After graduating in physics from the First University of Rome, La Sapienza, Franco Manfredi moved to the Milan Polytechnic to work with Emilio Gatti. At the Polytechnic, in 1976, he became a full professor of Nuclear Electronics. He was also a full professor of Electronics at the University of Milan and at the University of Pavia. That was before joining, in 1997, the Lawrence Berkeley National Laboratory in Berkeley, California, as a senior staff scientist.

During his scientific career, Franco oriented his research interests to radiation detectors, detector signal processing, noise limits in electronic devices and front-end electronics for different detector applications. He led international projects in the area of low-noise front-end systems for the acquisition and processing of signals from radiation detectors in nuclear and elementary particle physics. His work was strongly inspired by his belief that front-end electronics developments are among the main forces responsible for the progress in physics.

The tribute to Franco Manfredi took place in one of the historic halls of the University of Pavia, dedicated to Alessandro Volta, who held the chair of experimental physics in Pavia for nearly 40 years during the 19th century and is mostly known for his work in electricity. This is indeed an excellent location to remember a gifted teacher and a passionate and brilliant researcher such as Franco Manfredi, who taught electronics to generations of students and mentored and inspired many young researchers.

The workshop was made possible through funding from the Department of the Electrical, Computer and Biomedical Engineering of the University of Pavia and from the NPS Italy Chapter. It was attended by about 40 people, including former students, collaborators and colleagues of Franco Manfredi’s from Pavia and other universities and research institutes in Italy, Europe and the United States. The day was introduced by Franco’s sons, who shared their memories with the audience and showed and commented on a few pictures and documents portraying their father’s family life. The workshop scientific program (still available on the web, https://agenda.ipno.nps.org/15/manfredi.html) included eight presentations in some of the fields where Franco

Marinelli’s contributions were most significant: low-noise circuit design, radiation detectors, read-out electronics. The lectures were subdivided into one morning and two afternoon sessions. The spirit of the presentations was not only, or not mainly, that of recalling and going through Franco Manfredi’s scientific activity. The invited speakers also outlined how his work and ideas are still stimulating and influencing current research projects and activities in the field of low-noise front-end electronics for radiation detectors, and beyond. The workshop was also the occasion to announce two prizes to be awarded to M.Sc. and Ph.D. students in Electronic Engineering and in Physics. One, in honor of Emilio Gatti, also recently deceased, and Franco Manfredi, for the best M.Sc. thesis on experimental activities in fundamental physics with the use of low-noise electronics, will be funded by the Società Italiana di Fisica (SIF, Italian Physics Society) and by the Ricerca Fondamentale in Fisica (Fundamental Research in Physics) Association.

The day concluded with a social dinner in Santa Maria della Scalea, a disconcerted church in the heart of Pavia, where the participants had some more time to recall the memory of their teacher, mentor, colleague and friend.

This article was prepared by Lodovico Ratti who can be reached by E-mail at Lodovico.Ratti@mi.infn.it

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Vernon Gabriel Price, 1924-2016

Our beloved father, Vernon Gabriel Price, passed away peacefully the morning of November 30, 2016 in Los Altos, California. He was 92 years young and a resident of Los Altos since 1960.

Vernon was born on October 15th, 1924 in Salt Lake City, Utah to Charles Elton and Renee Lota Felt Price. He was a Belknap learner, starting as a boy when he tinkered with radios and became fluent in German. He got his ham radio license (W6WRY) when he was fourteen and continued to be an active amateur ham radio operator until his death (4W6M, after the Extra Class). He absolutely adored his family, which included his three brothers and two sisters.

During World War II, Vernon served in the U.S. Navy where he worked on airborne electronics and radar systems. Afterward he received his BS/MS degrees in Electrical Engineering at the University of Utah and continued his education at Stanford University. But he didn’t stop there. He took classes on history, politics, and of course his ham radio. In his final days before his death, he continued to do all the back-room work in the laboratory (as a microwave engineer, and then worked as manager of accelerator operators for many years. He started when they were still planning the beam and the offices were in trailers on Stanford’s campus, and finally retired from the lab in 1992. Vernon was a Life Senior Member of IEEE and served as the membership chair for the Nuclear and Plasma Sciences Society, where he enthusiastically promoted and encouraged membership in NPSS and other societies in the IEEE organization. He was an active member of the Administrative Committee for many years and even after turning over the chairmanship of the Membership Committee continued to do all the back-room work in processing applications. He also trained the people you now meet at NPSS membership desks. He worked diligently for NPSS until only a few days before his death.

His hobbies were varied and as interesting as he was. He was a private pilot and loved to fly. He also enjoyed sailing, genealogy, astronomy, travel, music, politics, and of course his ham radio. In his final years, his home became a lab filled with his favorite hobbies. He noticed his sweetheart Patricia Forbush when she rode by his home on her horse. Vernon and Patty fell in love and married on September 1, 1948 in the LDS Salt Lake Temple. They spent several years in Tokyo, Côte d’Azur, San Diego, and Palo Alto before settling into their ranch home on Berkeley Court in Los Altos. In 1962 he joined the Stanford Linear Accelerator Center (SLAC—now the SLAC National Accelerator Laboratory) as a microwave engineer, and then worked as manager of accelerator operators for many years.

Vernon was a faithful member of The Church of Jesus Christ of Latter-day Saints (LDS) and truly enjoyed attending services every Sunday. He was loved by many and will be greatly missed by those who knew his warmth and kindness. His family never knew a day without his love, since he showed it with every word and action. Goodbyes could include a cheery “Thanks for calling” or an “I love you” in Morse code while holding your hand.

He is survived by his children Gayle Price, Mary Price, Karen Zomos, Judy Miller, Paul Price, Martha Siegel, and Gwen McLean; his spouses; his nine grandchildren and eight great-grandchildren. He is preceded by his beautiful wife, Patricia, and their eldest son, Steven.

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Opportunity to Sign a Petition to Allow a Candidate to be Considered in the Next IEEE Election.

Dear NPSS members,

The IEEE Board of Directors has selected two president-elect candidates for the annual election to be held later this year. In the opinion of many members, a third outstanding person, José M. F. Maesa, should have also been selected. If you would like to ensure the strongest slate of candidates, please consider “signing” José’s petition at http://www.ieee.org/petition, and following the link to “Annual Election Petition”? He needs 3720 signatures to get onto the ballot, not an easy task.

Signing the petition does not obligate you to vote for José. It is purely to allow him to be considered. If his petition is successful, members will be able to compare the qualifications of the three candidates and vote for the candidate of their choice.

José did an outstanding job last year as the IEEE Vice-President for Technical Activities. Further information about him is available at http://www.josemaesa.org, and at http://www.ieee.org/musca/jommaa.

Sincerely,

The NPSS Executive Committee

Stefan Ritt, President

The NPSS Executive Committee

Stefan Ritt, President

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