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 500 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—Transiting 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, IFE and IFE Alternate Concepts, Innovative and Disruptive Technologies, Dwarvers and High Heat Flux Components, Chambers, Blankets, and Shields, Fueling, Extraction, 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 RAM, Magnet Engineering, Power and 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 premier 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 content 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

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.

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

For the Young Professionals reception, experienced staff will share their instrument experiences to inspire and encourage young professionals to continue in fusion engineering and research. Dr. Richard Hygen 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 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 PPL, 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.

The SOFE awards banquet will be held on Wednesday evening. Participants can enjoy dinner with colleagues and friends 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 an comprehensive introduction to plasma-material interactions with an emphasis on fusion plasmas. This mini course will address issues 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 and computational modeling of the plasma edge and materials, where the plasma/material interface plays a crucial role in material performance and behavior. A unique aspect of this mini course is to bring together those who not only have expertise in plasma-material interactions, but also extensive experience both in PMI experiments and in multiscale computational PMI modeling. This 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, PM diagnostics, computational PMI, and PM of the divertor, PM 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 neutrinos mini course 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 ratios (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, sustainability of structural materials in 14 MeV neutron environment, and have an impact on reactivity management during operation and after decommissioning. This mini course covers the basics of fusion neutronics, nuclear assessment approaches, latest design philosophy, and applications for ITER experimental facility, conceptual magnetic tokamak/spherical tokamak/ballisticity 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 conversations with the 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 exhibitors are invited to a reception that showcases the vendor booths. Please drop by the vendor booths during the conference to learn about their latest innovations and contributors 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 more information about the exhibit, booth sizes and locations, please visit https://sofe2019.utk.edu/sponsors.html.
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 1,800 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 area 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 convened 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 875 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 region with a high level of activity. The city offers a great conference venue and a warm welcome to the delegates. The attendees found this conference to be a great success and attended by more than 100 scientists and engineers.

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

Best regards,
Anatoly Rozenson
General Chair
Ralf Engels
Deputy General Chair
Email: nsrmic2018@ieee.org

### 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 conference was a great success and attended by more than 100 scientists and engineers.

The conference was well organized and had a social program that included a variety of tours allowing attendees to enjoy picturesque Sydney from both land and water. The conference was held in the ICC on beautiful Darling Harbour, which provided a quiet atmosphere and convenient 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.

The conference was supported by industrial sponsors and the New South Wales Government, providing financial support for 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 included more than 90 oral sessions and 875 poster presentations. The Women in Engineering (WIE) lunch was a great success and attended by more than 100 scientists and engineers, including both men and women. The conference also included a special feature of a well-organized social program that offered delegates a variety of tours allowing them to enjoy picturesque Sydney from both land and water.

Holding the conference in Sydney has demonstrated that IEEE Region 10 - Asia Pacific - is a sophisticated region with a high level of activity. The city offers a great conference venue and a warm welcome to the delegates. The attendees found this conference to be a great success and attended by more than 100 scientists and engineers.

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

Best regards,
Anatoly Rozenson
General Chair
Ralf Engels
Deputy General Chair
Email: nsrmic2018@ieee.org

### 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.**

**I feel like a mosquito in a nudist colony.**

We have an excellent website, which is overseen by Dick Kosse. Please check it out at ieee-press.org. Martin Purchese 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 Dresdner), Transactions on Medical Imaging (edited by Michael Insana), 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 indexes.

There is a movement in technical publishing toward “open access,” a model in which published papers are freely available online 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.

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 welcoming your feedback.

Sincerely,
Ron Schrimpf
IEEE NPSS President,

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**You’re Excused**

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

**WE NEED MORE VOLUNTEERS!**

We are looking for new volunteers to help support the NPSS. If you are interested, please contact the NPSS office.

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**SOCIETY GENERAL BUSINESS**

**NEW APPOINTMENTS**

Deputy General Chair
- Ralf Engels
- Svetoslav Svetlichny

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**President’s Report**

The column makes 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. I have been involved in the society ever since. I am particularly thankful to many of the volunteers who have contributed to the success of NPSS conferences and reading NPSS journals.

In this year’s edition of the President’s Report, I 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 welcoming your feedback.

Sincerely,
Ron Schrimpf
IEEE NPSS President,

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**Rafael Schrimpf, IEEE NPSS President, can be reached by E-mail at rafael.schrimpf@vanderbilt.edu**
NPSS News

Secretary's Report

Ralf Engels, our Treasurer, noted that conference disbursements are going better than all 2017 conferences. Closed in or in audit, 2017 conferences closed in the black but with lower-than-budget revenues. 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, it 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 Operations Chair responsible for that conference. Conferences are required to use our web budgeting tools. 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, facility imported to export to fiscal reports, 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.

ACOM ACTIONS

• That AdCom approve the NPSS Instrumentation Tool Initiative for the $168.8k allocated. 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.

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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 Middel can be reached by E-mail at stevemiddle@sydney.edu.au.

NEWLY ELECTED ADOC MEMBERS

Adam Alessio
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 analytics. Dr. Alessio’s research group actively conducts 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.msu.edu/~alessio/.

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

Anna Grasselino
Anna Grasselino 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 Systems. 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 M.D. 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, followed by Scientia.

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

Anna Grasselino can be reached by E-mail at anna@fnal.gov.

NEW TECHNOICAL COMMITTEE CHAIRS

Janet Barth, Chair, AE 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 electronics to several of NASA’s science missions, including, the Solar Dynamics Observatory, the Swift Burst Telescope, the Lunar Reconnaissance Orbiter, the Global Precipitation Measurement mission, the Magnetospheric Multiscale mission, and the James Webb Space Telescope. She also oversees 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 hardening 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 preformation/proposal team and the LWS Program Science Architecture Team. In 2001 she was selected as the Project Manager for the LWS Space Environment Testbed and from 2002 to 2006, 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 2015-2014, 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 (NURSEC), 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 Dosimetry Conference on Components and Systems (RADCONC) and an IEEE NPSS Distinguished Lecturer.

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

Katherine 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 2003-2006. 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 performance of the existing APS injectors. In prior roles, she led the successful commissioning of two superconducting undulators at the APS. She is

Chiara Guazzoni, born in Milan, on December 6, 1972, is a 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 and in 1996 she attained a Master 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 Technical 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 SF. In 2004 she received the 2004 IEEE NPSS Radiation Instrumentation Early Career Award, for “contributions to an innovative X-ray imaging system 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 in beginning in January 2019 she serves as Chair of RISC. She was appointed Chair of the RISC Awards Subcommittees 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.

Jessica Hudson

Jessica Hudson can be reached by E-mail at jhudson@npss.oregonstate.edu.
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. He holds two patents.

Dr. Harkey serves on the Australian Synchrotron Machine Advisory Group. In the past, he 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 PhD. 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. Harkey 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 Alumnus award from Purdue University.

Katherine Harkey can be reached by E-mail at kharkey@lcls.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. 1993) 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, (Maxwell-Maxwell 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 (NWSS) and radiation sources for the US, UK, and France; the design of pulsed-power systems and charged particle beam-doses 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 sijgals; intense pulsed active detection methods for DoD and the UK Ministry of Defence; the study of accelerated decay of radiotopes as “advanced energetic materials.” In recognition for support of DOE Stoppel-Based Stewardship research, he was the co-recipient of three DOE Defense Program Awards of Excellence (2002, 2004, and 2017) and Free NREL Alan Berman Research Publication Awards (2001, 2006, 2012). He is a senior member of IEEE, Chair of NPSS Plasma Sciences and Applications Conference, 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.

A strong group of nominess 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 (SOFI), to be convened June 2nd–4th, 2019 at the Sawaiag Market in Porte-Vida Beach, Florida. (See cover story)

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

It is our pleasure to announce the award winners from the 2016 NSREC. Their awards will be presented at the 2019 Conference.

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

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

We shall... You can’t escape necessities, but you can overcome them.

TILL IT BURSTS There’s only one thing that can keep growing without nourishment: the human ego.

WE SHALL… I’m kept busy The successful people are the ones who can think up things for the rest of us to keep busy at.

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

WE SHALL… Saneus the younger

TILL IT BURSTS Marshall Lumsden

I'M KEPT BUSY Dan Marquis

WORTH THE WAIT Samuel Butler

HEIGH-HO!, HEIGH-HO! Chuck Chee

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

WE SHALL… San basal the young

TILL IT BURSTS There’s only one thing that can keep growing without nourishment: the human ego.

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

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

WE SHALL… I’m kept busy

TILL IT BURSTS

I'M KEPT BUSY

WORTH THE WAIT

WE SHALL…
In 2009, he joined the Electrical Animal PET Scanner and the implementation of USA. He was a key designer of the Rat Conscious Université de Sherbrooke, Sherbrooke, QC, Canada. While doing his Ph.D. work, he was a research member of the group that structure physics, including NEMOBALL, DEMON, EURODAM, EUROLID, 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.

The prestigious Glenn F. Kron 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.

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 nominations 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 awardees extremely difficult. We would like to thank all the nominees for 2018 for rising up to the 2018 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 Kron Radiation Instrumentation Outstanding Achievement Award was presented on November 12th, 2018 during the opening ceremony of the 2018 IEEE 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 is working at the National Center for Nuclear Research in Swierk (Poland). In 1996 he received his Ph.D. and in 1971 his D.Sc. (habilitation). In 1972 he became an Associate Professor and in 1993 he was full Professor at the Institute. 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-ray 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

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

Starting from 2018, RISC assigns these prestigious awards: the Radiation Instrumentation Early Career Award (RECIA), the newly established Ermilo Catti Technical Achievement Award and the Glenn F. Kron Radiation Instrumentation Outstanding Achievement Award (ROIDA). 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 for 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 outstanding contributions to the development of optical time-correlated single photons counting integrated with Single Photon Avalanche Diodes three-dimensionally integrated to custom readout circuits.” Gabriella Pratte, Dean for Research at the Université de Sherbrooke, presented the awardee received a copy of the Glenn Knoll certificate and the plaque, this year, for the first time, for the first time, for the first time, for the first time, for the first time.
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/PS/SWA/NB) was formed by the reorganization of an existing EMB chapter that did not include NPSS participation. Its organizer and chair is Steven Cakici, Chair of the Cleveland Section. Next, in late May, the new Toio Tech University SBC was established. Its faculty advisor is Prof. Andreas Neuber, and its founding chair is Henry Gaus. Melvin Powell, the co-founder 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. Fahad Bag. Its founding chair, Joseph Strehlow, and its cofounder and co-chair, Nicholas Ajbar, also received Chapter Founder’s Plaques, which will be publicly presented in 2019. Also in late February, the AD. Patel Institute of Technology (ADIT) SBC was established in Gujarat, India. Its faculty advisor is Prof. Atulbhai Thakor, and its founding chair is Satish Sha, who also chaired the institute’s IEEE student branch. Satish 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 Institute of Technology in India, and the second at the Madhushan and Bhanushali Women Institute of Engineering for Studies and Research in Computer and Communication Technology (WIBICT), whose faculty advisor and founding chair are Prof. Nairal 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 Lectures 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://ieee-npss.org/chapters/.

If you are interested in establishing a local chapter of the NPSS, please contact Steve Gold, the NPSS Chapter Coordinator, at steveg@ieee.org.

NOtMATIONS
Four NPSS AdCom Positions Open for Nominations
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)
• Paired 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 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 +1 561 310 3728 E-mail at stefan.ritt@psi.ch.

SWEEt TAlK??
[SN] told enough white lies to ice a wedding cake.
Margot Asquith

IEEE Smart Village (ISV) 2018—Another Year of Accomplishment

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 which, according to World Bank, Vietnam is one of the 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 Pooner 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 scholarship assistance for its entrepreneurs to take either Certificate or Masters of Development Practice degrees.

Enterprise (Entrepreneurship). 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, sanitation and hygiene (WASH) programs which are equally vital. The Papua New Guinea program is coupled with a Rotary International WASH program, as 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-ground program manager 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 WHELS Global Foundation, based in India and the U.S., connected with India
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 has 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.

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 collision rate and hence 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 (eLUP), 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 eLUP implements more recent technologies, such as 7th series Xilinx FPGA 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.

The eLUP 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 KDBus - composed of five single-ended and 21 differential lines. The Zynq-7 is the master FPGA and 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 happen 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 (GTs) [3] running at up to 12 Gbps. The transceivers are connected to several types of connectors (PCIe, SFP+, FMC, GbE-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.

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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 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 [3]. 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.

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Lee Barry (Coalition for Plasma Science)
Peter Clout (IEEE-USA Energy Policy)
Martin Grossmann (Social Media)
Robert Miyaoka (TMI)
Harold Reicher (WECCE)

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CONTRIBUTED ARTICLES
Publicly released 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 technical 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. Items of interest to important ongoing technical endeavors. 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 significant industrial applications. 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 significant industrial applications. 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 significant industrial applications.

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