NPSS NEWS

ISSUE 4: DEC. 2022

Celebrating 50 years of Plasma Sciences at ICOPS 2023: The 50th IEEE International Conference on Plasma Science (ICOPS)

21st-25th May 2023
Eldorado Hotel and Spa, Santa Fe, NM, USA

The 50th IEEE International Conference on Plasma Science (ICOPS) will be held 21st–25th May 2023 at the Eldorado Hotel and Spa in Santa Fe, New Mexico, USA (https://goto.unm.edu/icops2023). ICOPS is an annual event organized and sponsored by the Plasma Science and Applications Committee (PSAC) of the IEEE Nuclear and Plasma Sciences Society (NPSS) and is one of the premier plasma science conferences in the world.

This is the 50th offering of this conference and will follow the format of previous ICOPS programs covering traditional areas of plasma science and engineering, as well as new exploratory research areas. In addition, we are planning events to commemorate the 50th golden jubilee, including a special session track on the past 50 years of plasma science, a distinguished keynote speaker, and a special issue of the highly regarded *IEEE Transactions on Plasma Science*.

Similar to previous ICOPS, this conference will offer an outstanding forum for scientists and engineers to engage on advances in plasma science and technology and to discuss future directions of research. The conference also features exhibits and a 1.5-day minicourse entitled *Industrial Applications of Plasmas*. Invited and plenary papers will be published in a Special Issue of the *IEEE Transactions on Plasma Science*.

This conference will be held in Santa Fe, New Mexico on 21st -25th May 2023 with a principal venue at the Eldorado Hotel and Spa, supplemented by conference sessions at the Historic Hilton Hotel and a golden jubilee reception at the La Fonda Hotel. All three conference venues are either on the plaza or a very short walking distance of the historic downtown area known as the Santa Fe Plaza.

LOCATION

Santa Fe is a perfect location for an international gathering of the world's experts in the science and technology of plasmas and pulsed power. It is situated in close proximity to distinguished universities, three major U.S. national laboratories, and a vibrant technology industry that engages in plasma science and engineering.

This area has a definitive *European* vibe, and offers a unique blend of Anglo, Spanish, and Native cultures. Santa Fe has been a cultural center in North America for over 400 years and is the oldest capital city in the United States. Northern New Mexico is acclaimed as a vibrant center of native Pueblo culture, which has occupied the Santa Fe region starting approximately 12,000 years ago, long before European colonization began in 1610 AD. To preserve its distinct cultural

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influences, Santa Fe maintains strict territorial and Spanish colonial architecture guidelines that is characterized as the *Santa Fe adobe style*.

Today, Santa Fe welcomes visitors with world-class accommodations with a local feel, a dynamic art scene that spans traditional to contemporary, world-class museums, diverse and award-winning cuisine, and countless experiences to encounter. Santa Fe is also known for its world-renowned opera, art galleries, many shops and boutiques, and other forms of entertainment from dance to theater to music which can keep visitors busy both day and night.

Set at an elevation of 7,000 feet (~2100 meters) at the foothills of the majestic Sangre de Cristo mountains, Santa Fe's climate offers sunny, temperate days with cool evenings. Surrounded by over 1.5 million acres of National Forest, historical archaeological sites, and public lands, Santa Fe's forested mountainous landscape affords visitors with easy access to many outdoor recreational activities such as backpacking, camping, kayaking, hiking, hunting, mountain biking, mountain climbing, bird watching, and white-water river rafting. Golf, tennis and even bird watching are other ways to enjoy the region.

THE ORGANIZING COMMITTEE

The 50th ICOPS organizing committee includes faculty from the University of New Mexico, local industry partners, Imperial College and researchers from Sandia National Laboratories, Los Alamos National Laboratory, and the Air Force Research Laboratory.

The 50th ICOPS is being managed by Lisa Boyd of IEEE's Meetings, Conferences, and Events Services. The General Conference Chair is plasma physicist Dr. Tom Tierney, who is a senior scientist at the Los Alamos National Laboratory, and the Technical Program Chair is Dr. Salvador Portillo, research professor at the University of New Mexico (UNM) working on HPM, HEDP and pulsed power. The conference treasurer is Dr. Sarita Prasad of Innovative Microwave System Prototypes (IMS-Pro LLC) and the conference webmaster is Mr. Chuck Reuben of UNM.

The conference minicourse on Industrial Applications of Plasmas is being organized by Dr. Evgenya Simakov of Los Alamos National Laboratory. The conference will also feature a Young Professionals event and career fair, organized by UNM Assistant Professor Viktoriia Babicheva. In addition, ICOPS 2023 will host a Women in Engineering event and reception that is organized by Dr. Monica Blank of Communications & Power Industries, LLC. Professor Simon Bland of Imperial College London and Dr. Remington Reid of the Air Force Research Laboratory will organize the Student Paper competition and awards.

In honor of the 50th golden jubilee of ICOPS, the 50th Anniversary Track is led by Dr. Mike Mazarakis, principal member of the technical staff at Sandia National Laboratories, and UNM Distinguished Professor and Associate Dean for Research and Innovation Dr. Edl Schamiloglu is guest editing a special "50th Anniversary" issue of the *IEEE Transactions on Plasma Science* comprising invited review papers. Mr. Matthew Lara and Dr. Jon Mayes of Applied Physical Electronics (APELC) and Professor Edl Schamiloglu of UNM will organize the Sponsorship and Exhibits event.

TOPICS

The IEEE 50th International Conference on Plasma Science (ICOPS 2023) covers the following topics:

Dr. Tom Tierney
Conference General Chair

» Basic Processes in Fully/Partially Ionized Plasmas

» Microwave Generation and Plasma Interactions

» Charged Particle Beams and Sources

» High Energy Density Plasmas and Applications

» Industrial, Commercial, and Medical Applications

» Plasma Diagnostics

» Pulsed Power and Other Plasma Applications

» Matter at Extreme Conditions

On behalf of the ICOPS 2023 local organizing committee, I welcome you to participate in this golden jubilee of ICOPS! Bienvenido!

Dr. Tom Tierney
ICOPS 2023 Conference Chair, Senior Scientist,
Los Alamos National Laboratory,
can be reached by E-mail at ttierney4@comcast.net

2023 International Pulsed Power Conference

June 25th-29th, 2023, Grand Hyatt, San Antonio, Texas

The 24th biennial International Pulsed Power Conference (PPC) will be held at the Grand Hyatt Hotel in San Antonio, Texas between June 25th -29th , 2023. The Grand Hyatt, situated on the historic San Antonio River Walk, is an ideal location for the pulsed power community to network in-person for the first time since the COVID pandemic. The hotel is a short walk from San Antonio Station, conveniently located for travelers to quickly reach the hotel from the San Antonio International Airport via public bus or taxi.

San Antonio is a celebrated cultural center of the Lone Star state with culture, cuisine, music, and history unlike anywhere else in the world. Located directly on the River Walk and within walking distance of the Alamo Plaza, the Grand Hyatt offers both ample space for the conference activities and a charming Texas atmosphere. Along the River Walk, visitors will enjoy easy access to a vibrant mix of restaurants, shops, music, art, and history.

Conference General Chair, Stephen Bayne (Texas Tech University) and Technical Program Chair, Susan Heidger (Air Force Research Laboratory) invite participation and contributions from the international pulsed power community in the following technical areas:

» Pulsed Power Components & HV Insulation

» Compact Pulsed Power Topologies

» HV Switches

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» Industrial & Medical Pulsed Power Applications

» High Power Microwaves, RF Sources, & Antennas

» High Energy Density Physics and Technology

» Particle Beam and Accelerator Technologies

» High Power Electronics & Batteries

Abstract submissions are now open and will remain open until February 1st, 2023. Notice will be sent to authors of accepted abstracts by mid-March. PPC2023 participants are also invited to contribute to the special issue of the *IEEE Transactions on Plasma Science*. Submissions to the journal will be peer-reviewed and are expected to be expanded versions of the conference submissions. The deadline for the special issue submission will be the last day of the conference, June 29th, 2023.

Please visit the conference website (https://ppc2023.org/) for more up-to-date information, further technical detail, and travel information. Contact: Jacob.c.stephens@ttu.edu

THE LEFTOVERS

Things may come to those who wait, but only the things left by those who hustle.

Abraham Lincoln

AND THE WEAK SHALL INHERIT THE EARTH

Strong people have strong weaknesses.

Peter Drucker

Stephen Bayne (TTU)
General Chair

Susan Heidger (AFRL)
Technical Program Chair

Conference Report

Real Time 2022—Making the Best of 17 Time Zones

One of the running themes for this year's Real Time Conference was, let's try to put more "Real" back in Real Time - not necessarily an easy task when, once again, the conference was 100% virtual, and the participants were spread over nineteen countries and seventeen different time zones. However, in the end, the 23rd edition of the IEEE NPSS Real Time Conference went very smoothly with only a few minor hiccups.

In hindsight, the decision back in January to go virtual one more time was probably for the best for everyone, both the organizers and the participants. As the summer unfolded, the chaos that was the international air travel industry affected everyone, and of course most of our colleagues from China were only able to participate virtually.

The first virtual Real Time conference in 2020 (RT2020) was a new experience for most of us. Many of the tools that were available to support virtual conferences were in their infancy, and we all were trying to understand how best to use these tools and adapt to what was becoming the new normal for conferences everywhere. The NPSS Computer Applications Technical Committee (CANPS) experimented with a number of options for RT2020. Some were more practical than others. Since that time both the tools and our experiences running virtual meetings have evolved significantly.

David Abbott (CANPS Chair), based at Jefferson Lab in Virginia and Martin Grossmann (RT2022 General Chair) based at PSI in Switzerland were the co-hosts for the five-day Zoom-based meeting. Each "day" was structured similarly, lasting around five hours. The days included two plenary sessions (early and late) with a more unstructured, interactive poster session between them. Most of the feedback from participants indicated that this was just about the right total length of time and having the poster session (using the online social interaction space oVice) to break-up the more formal plenaries worked well. The Zoom plenaries were held using a regular Zoom meeting instead of a webinar, allowing everyone to participate, Almost all the talks were given live. This included the Real Time traditional two-minute Mini-Orals. These are the popular advertisements that poster presenters are offered during the plenary to entice participants to come visit their poster.

Of course, because of the range of time zones, some participants would have to get up at 04:00 while others would have to stay up until 02:00 to take part live. Hence, everything was recorded and made available on the website for later viewing. In addition, the program was organized as best we could to ensure that no

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one who was presenting would have to do so at the extremes of their specific zone.

We chose to use the browser-based oVice virtual space (https://ovice.in) to host the daily poster sessions, but it was also a venue that allowed all participants to see each other and have personal interactions (audio and/or video chats) in a manner that is more like being at an in-person conference. This space was available 24 hours a day throughout the whole week of the conference. Each poster area provided embedded links to both a poster file as well as an optional recorded video presentation. Virtual tables for participating vendors and IEEE/NPSS Membership were in the space as well.

Some notable highlights for RT2022 included a presentation by this year's CANPS Award winner, Ray Larsen, for *Outstanding professional achievement and contributions to the development of emerging new nuclear electronics standards for Physics*. In his talk, he reflected back on his role in the development of many standards for physics instrumentation that most of us today simply take for granted. These included NIM, CAMAC, FASTBUS, and most recently ATCA/mTCA adaptations for physics applications.

The Student Paper Award competition this year was highly competitive. Most of the entries were quite strong, and the judges struggled to declare a single winner. In the end it was decided to make the unusual decision to announce two first-place awards. The first award went to Ignacio Garcia Siguero, a Master's student at the Technical University of Madrid. His paper was on the general topic of real time safety and security for the ITER fusion project and was entitled Verification and Validation of ITER Interlock System Fast Architecture according to IEC61508 standard. The second award was given to Yixin Li, a Ph.D. student from Stony Brook University in New York. His paper described developments for imaging using machine-learning techniques to optimize Prism-PET instrument performance. His paper was entitled, Decision Tree for Demultiplexing in Prism-PET. We hope to highlight these students and their research in future NPSS Newsletter issues.

On a final note, we were able to collect some statistics on this virtual conference that paint a curious picture. While the overall satisfaction for participants was quite high (4.5/5), only a little over a third of the participants attended all five days of the conference. We had a high percentage of first-time participants (over 50%), but this year's total registrations were only at about 75% of participation in comparison to both the last in-person conference (in 2018) and the 2020 virtual conference. Perhaps we are seeing effects of general virtual conference fatigue? We did expect, given the August dates, that we would lose some participation because of vacations, particularly in Europe. Geographic breakdown of participation is shown in Figure 1. (Asia/Pacific 47%, Europe 32%, Americas 21%).

The CANPS ExCom wishes to thank all those who did participate in this year's conference. You made it a

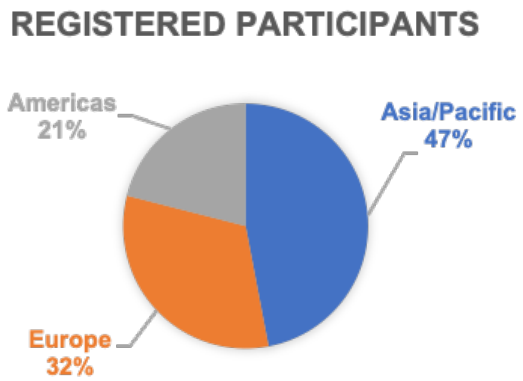
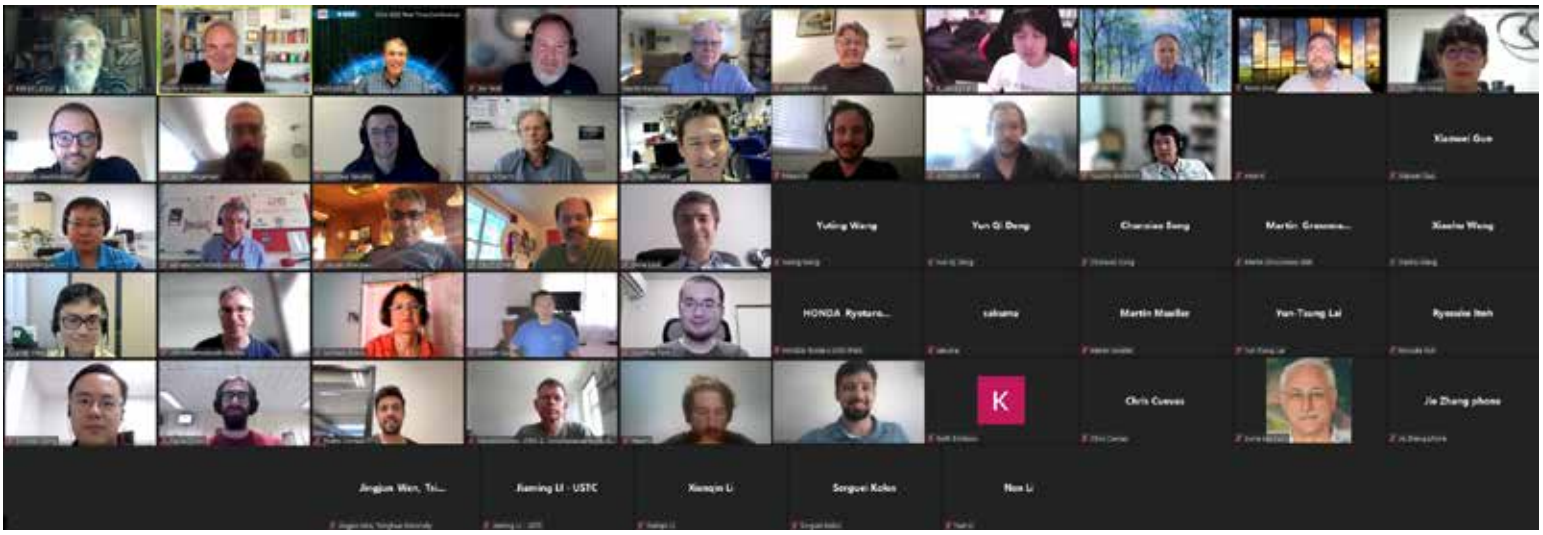


Figure 1.

Ray Larsen (lower right) receives CANPS Award.



Real Time Conference attendees.

success. We are already working toward holding the 2024 conference in person once again, understanding that we will need to provide a hybrid element. We believe, however, that Real Time will always be most successful when we can bring together real people in a real place presenting real research, and, after we are done, adjourning to more relaxed discussions over some real food and perhaps a real nice glass of wine.

David Abbott, Chair of the CANPS Technical Committee, can be reached by E-mail at abbottd@jlab.org.

David Abbot CANPS Chair.


Martin Grossmann RT2022 Chair.

President's Report

Steve Meikle
IEEE NPSS President

I recently attended the Total Body PET conference in Edinburgh and the combined Australian Society and Federation of Asian Societies for Molecular Imaging (ASMI/FASMI)) in Melbourne. These were the first conferences I attended in person since the beginning of the pandemic in early 2020. It was a joy to be able to interact face to face with colleagues and friends I hadn't seen in more than two years and to meet many new people, including students who have recently entered the field. It reminded me how important social interactions are to the experience of participants at our conferences – the conversations over coffee between sessions, during the lunch breaks and at the social events in the evening.

By the time this newsletter goes to print I will have attended my third in-person conference for the year, my primary conference, the IEEE Nuclear Science Symposium, Medical Imaging Conference and Room Temperature Semiconductor Detector Conference (NSS/MIC/RTSD). This year we will meet at the Milano Convention Centre (MiCo) in northern Italy and I am very much looking forward to it. As with many other conferences this will be the first time we have met for two years, having held virtual events in the interim. The NSS/MIC/RTSD in Milano will be a hybrid event, as were the conferences mentioned above. By now, we are becoming accustomed to hybrid meetings and the organisers are getting very good at managing the challenging logistics of organizing such meetings. It certainly feels like we are well into the post-COVID transition, adapting to new ways of doing science, teaching and life in general. Of course, COVID-19 has not gone away and we will be living with it for quite some time to come.

When I wrote my first newsletter article as President of NPSS in early 2021, I highlighted the challenges and opportunities presented by open access publishing. The IEEE has done a lot of work over recent years to address these challenges and opportunities, having established new open access journals covering most of the IEEE technical fields of interest and giving societies and councils the option of flipping their subscription-based journals to open access, without any obligation to do so. NPSS decided not to flip any of our three journals nor *Transactions on Medical Imaging* which we co-sponsor with three other societies. Instead, we have kept a watching brief on IEEE policy, the open access movement, including decisions taken by the major funders of research in Europe, the USA and elsewhere, and the trend towards transformative agreements with academic institutions. However, a directive by the United States Office of Science and Technology Policy (OSTP) was announced in August which we believe will be a game changer. Briefly, the US federal government is mandating that, as of 2025, journal articles arising from federally funded research (e.g. NIH and NSF) must be made publicly accessible without an embargo on their free and public release. Currently, authors and publishers have a 12-month embargo period during which published research can be kept behind a pay wall. Some of the implications of the OSTP directive for scientific publishers, such as IEEE, are unclear at this point in time but it is certain to have an impact on the revenue IEEE earns from its journals which, in turn, has implications for Society budgets. We will continue to monitor this and other open access developments very closely and keep the membership informed.

This is my last newsletter article as President of NPSS. However, I am not leaving AdCom just yet. I look forward to serving as Nominations Chair and Past President over the next two years and then as Awards Chair after that. I would like to take this opportunity to thank all the members of AdCom who have served the Society so well over the last two years. I am especially grateful for all the unheralded work our Secretary, Albe Larsen, does behind the scenes in organizing our AdCom meetings and supporting me and the executive between meetings. I also wish to thank our Vice President and President-elect, Vesna Sossi, for her outstanding support over the last two years. She has been a sounding board and valued collaborator as we have implemented various initiatives and reforms, and I wish her all the best as she takes the "gavel" next year. Vesna has a clear vision about what she wants to achieve in her two-year term as President and I look forward to working with her over the next four years. The Society is in very good hands.

Steven Meikle

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

Secretary's Report

Albe Larsen
IEEE NPSS Secretary and Newsletter Editor

As Steve indicated above, our final AdCom meeting of the year will be held at the end of the NSS/MIC/RTSD conferences in Milan, Italy and this Newsletter will be in production long before that event, so the report on that meeting will be in the March 2023 Newsletter.

However, I would like to use this opportunity to remind you that the deadline for Society Awards nominations is January 31st, 2023. By January our Awards Chair will be Dr. Ron Schrimpf of Vanderbilt University and Award nominations for the Merit, Shea, Early Achievement, Graduate Scholar, Birdsall, Barker, Kristiansen, and Jaszczak Awards should be sent to him, ron.shrimpf@vanderbilt.edu as well as to our outgoing Awards Chair, Dr. Stefan Ritt at stefan.ritt@psi.ch before the January 31st deadline along with all required supporting material. Detailed information about each award, as well as about several grants, can be found at https://ieee-npss.org/awards/npss-awards/. Nomination forms are found with each award and grant description as well as a list of former award recipients. Our community has many outstanding scientists and engineers well worth recognition, and graduate student awards provide both recognition and promise of future accomplishment. Please consider nominating outstanding members of your community for the appropriate awards!

And, while on the topic of nominations, don't forget that nominations for elevation to IEEE Fellow are due by March 31st every year. This process is more complex and time-consuming so it is none too early to start that process. Remember that nominees must be Senior members of IEEE for at least a year prior to nomination. It also makes this a good time to remind colleagues of the opportunity to become a senior member of IEEE after 10 years in their field, and after 5 years of significant performance. Information about membership and membership grades can be found at https://www.ieee.org/membership/grade-elevation.html.

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

Technical Committees

NUCLEAR MEDICAL AND IMAGING SCIENCES

Andrew Goertzen
NMISC Chair

At the time of writing we are getting ready for our first in-person IEEE NSS/MIC/RTSD meeting in three years. The meeting is organized as a hybrid event, with the in-person venue being in Milano, Italy from 5th–12th November 2022. Many thanks go to the organizing committee for their efforts in managing the challenges of arranging a meeting in the current environment of unpredictable travel restrictions. Next year's meeting will take us to Vancouver, Canada, with Vesna Sossi as General Chair, Tom Lewellen as Deputy Chair and Margaret Daube-Witherspoon and Rutao Yao as MIC Co-Chairs.

Congratulations to this year's Technical Committee award winners. The Bruce Hasegawa Young Investigator Medical Imaging Science Award is awarded to Fernando Hueso González from the Instituto de Física Corpuscular (IFIC), CSIC-UV in Spain for *contributions to the fields of in vivo range verification in proton therapy based on prompt gamma-ray imaging, as well as dosimetric optimization in brachytherapy and collision prevention in radiotherapy*. The Medical Imaging Technical Achievement Award is awarded to Prof. Jae Sung Lee from Seoul National University in Korea for *contributions to nuclear and medical imaging science and technology, especially developments of early SiPM-based PET systems*. Finally the Edward J. Hoffman Medical Imaging Scientist Award is awarded to Prof. Johan Nuyts from KU Leuven in Belgium for *contributions to image reconstruction in radiology and nuclear medicine*. Thank you to all those who have nominated candidates for these awards and for the work of the selection committees led by our Awards Subcommittee Chair Roger Fulton.

In 2022 AdCom established the NPSS Educational Committee (EduCom) as a new Functional Committee chaired by Stefan Ritt. NMISC was approached by EduCom to organize an IEEE NPSS School focused on nuclear medical imaging. Roger Fulton generously agreed to be the organizing chair for the first NMISC-themed school to be held in Nan and Bangkok, Thailand from 26th January – 2nd February 2023, coinciding with a meeting of the Thai Medical Physicist Society (TMPS). The training school will include a combination of lectures over 2.5 days on refresher topics and advanced techniques such as AI in nuclear medicine and kinetic modelling, followed by two days of hands-on workshop components and a Women in Engineering (WIE) event.

NMISC has an Initiatives Subcommittee chaired by Robert Miyaoka, created to support the development of applications to the NPSS Strategic Initiatives funding program. Examples of successful initiatives advanced by NMISC include the Balanced Representation Subcommittee, led by Joyita Dutta, and the Open Kinetic Modeling Initiative, led by Guobao Wang. The committee is actively looking for input from the MIC community on ideas for new initiatives that will enhance our conference, outreach and capabilities. Please contact Robert at rmiyaoka@uw.edu if you want to discuss your idea for an initiative project.

NMISC committee member Andrea Gonzalez Montoro from I3M-CSIC in Valencia, Spain recently participated in the IEEE TryEngineering Tuesday webinar series for the topics of Biomedical Engineering & Medical Imaging. The IEEE TryEngineering program aims to provide educators and students with resources, lesson plans and activities to foster the next generation of technology innovators. I encourage you to visit tryengineering.org to see the range of resources available through this program and to watch Andrea's webinar.

More information on NMISC activities is available at https://ieee-npss.org/technical-committees/nuclear-medical-and-imaging-sciences/

Andrew Goertzen, NMISC Chair, can be reached by E-mail at Andrew.Goertzen@umanitoba.ca

PULSED POWER SCIENCE AND TECHNOLOGY

Heather O'Brien
PPST Chair

The PPST Committee had a great visit to San Antonio, TX, in September and is busy finalizing plans for the 2023 Pulsed Power Conference to be held in-person in San Antonio. As General Chair for the 2023 conference, Dr. Stephen Bayne has put together an exceptional organizing committee, ensuring a rewarding experience for conference attendees.

I would like to formally congratulate all of the 2022 award winners from the pulsed power community as announced earlier this year: William Brooks for the PPST Arthur H. Guenther Pulsed Power Student Award, Daniel Maler for the NPSS Robert J. Barker Graduate Student Award for Excellence in Pulsed Power Applications, and Dr. Brad Hoff for the NPSS Magne "Kris" Kristiansen Award for Contributions to Experimental Nuclear and Plasma Science. The deadlines are approaching for nominations for the 2023 Guenther Award (due by December 15th, 2022), the 2023 Barker Award (January 31st, 2023), and the 2023 "Kris" Kristiansen Award (January 31st, 2023). Please consider supporting a nomination package for an outstanding student or professional from our pulsed power community.

Thank you to our PPST Committee members and AdCom representatives for your ongoing patience for virtual and hybrid meetings, your support for the 2021 and 2023 Pulsed Power Conferences, and your enthusiasm in engaging the pulsed power community.

Heather O'Brien, Chair of the Pulsed Power Science and Technology Committee, can be reached by E-mail at heather.k.obrien.civ@army.mil

POLITICIANS KNOW THEIR RIGHTS, ALAS!

Ethics is knowing the difference between what you have the right to do and what is right to do.

Potter Stewart

RADIATION EFFECTS NEWS

Robert Reed
RE Chair

Robert Reed, Vanderbilt University, is the present Chair of the Radiation Effects Steering Group, which oversees NSREC Conferences.

The IEEE Radiation Effects Committee (REC) held its annual Open Meeting on July 21st at the 2022 Nuclear and Space Radiation Effects Conference (NSREC). Presentations were given by the general chairs of the 2021 through 2023 NSRECs and the chair of the 2022 and 2023 European Conference on Radiation and its Effects on Components and Systems (RADECS).

Robert opened the meeting by recognizing elected and appointed members of the Radiation Effects Steering Group (RESG). The elected members of the 2022 RESG are Kay Chesnut, Raytheon, Vice Chair; Janet Barth, NASA (ret.), Past Chair; Arto Javanainen, Jyväskylä University, Secretary; Michael Campola, NASA Goddard Space Flight Center, Senior Member-at-Large, Rubén Garcia-Alia, CERN, Member-at-Large; and Mike Tostanoski Radiation Test Solutions, Inc., Junior Member-at-Large. Robert recognized Michael Campola as the outgoing member of the RESG. Rubén will take over as Senior Member-at-Large and Mike will take over as Member-at-Large. An election was held to determine the new Junior Member-at-Large; Megan Casey, NASA/GSFC, was elected.

Robert also recognized the elected members of the IEEE NPSS AdCom: Ken Galloway, Vanderbilt Univ. (term ends in 2023) and Keith Avery, AFRL (term ends in 2022). He followed this recognition by announcing candidates for the upcoming IEEE NPSS AdCom member election to replace Keith: Philippe Paillet, CEA and Michael Campola, NASA/GSFC.

Robert announced the general chairs for future NSREC Conferences: Keith Avery, Air Force Research Laboratory, 2023; Heather Quinn, Los Alamos National Laboratory, 2024, Dolores Black, Sandia National Laboratories, 2025, and Philippe Paillet, CEA, 2026.

Steve McClure, the General Chair of the 2021 Conference, summarized statistics of last year's virtual conference. A total of 569 people registered for the technical sessions and attended the short course which was included in the technical program registration fee for NSREC 2021. There were 137 student registrants.

Tom Turflinger, Aerospace Corporation, the General Chair of the 2022 Conference, summarized statistics of this year's conference. A total of 474 people registered for the technical sessions and 359 people registered for the short course.

The NSREC 2022 was held in person from July 18th – 22rd at the Utah Valley Convention Center in Provo, Utah. The technical sessions featured 110 papers that were presented during the five-day conference: 32 oral presentations, 34 poster presentations, and 44 poster presentations in the Radiation Effects Data Workshop. Four tutorial presentations were given at the Short Course, held July 18th.

Keith Avery, AFRL, General Chair of the 2023 Conference, discussed his plans for the 2023 Conference that will take place in Kansas City, Missouri at the Sheraton Crown Center, on July 24-28, 2023. The conference will feature a technical program with ten sessions of contributed papers that describe the latest observations and research results in radiation effects. The program will include oral and poster papers, with a separate dedicated poster session where authors of poster papers can discuss their results with conference attendees. A Radiation Effects Data Workshop and an Industrial Exhibit will be held. Attendees will also be able to participate in a one-day Short Course on Monday, July 24th where an outstanding group of technical experts will provide an in-depth discussion of Radiation Considerations for Board-Level Computing Systems. *See P. 18 for more Short course information.*

The most current information about the Nuclear and Space Radiation Effects Conference, including contact information and paper submission requirements, can be obtained on the new NSREC website: www.nsrec.com.

Robert Reed, Executive Chair of the Radiation Effects Committee, can be reached by E-mail at robert.reed@vanderbilt.edu.

UPDATES FROM THE RADIATION INSTRUMENTATION STEERING COMMITTEE

I am excited to report that we are tracking towards the very first hybrid Nuclear Science Symposium,

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Technical Committees

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John Valentine
RISC Chair

Medical Imaging Conference, and Room-Temperature Semiconductor Detector conference (NSS/MIC/RTSD) in Milan, Italy (November 5th–12th, 2022) with our sibling Nuclear Medical and Imaging Sciences Council (NMISC). While many uncertainties surround the ability to deliver a high-quality experience for both in-person and remote attendees, it is with great hope that we embark on this experiment. First, it will be fantastic to recapture those elements of the in-person conference that we have all missed over the last two years. This is particularly important for our graduate students and early career researchers as they build their own network of colleagues in our field, a critical element of ultimately propelling our community forward into the future.
In addition, we also hope that the ability to continue delivering the conference in a virtual format will enable a broader impact for the conference, allowing attendance for those who cannot afford the travel. Thanks to Chiara Guazzoni (General Chair) and all of the 2022 Organizing Committee for all of their hard work in navigating the last few years, planning our first hybrid conference, and executing what I'm sure will be an outstanding technical and social program! We look forward to seeing many of you in Milan and to learning from this first hybrid conference.

I personally am also looking forward to our first in-person Annual RISC Meeting in three years in Milan. This will be my first and only in-person RISC meeting as Chair. We will also be offering a virtual option for RISC attendance to ensure as many of the committee members as possible can participate. I look forward to meeting several of the members who started their terms over the last two years.

As a critical RISC task, we have had a subcommittee review and revise the Radiation Instrumentation Technical Committee Constitution and Bylaws (C&BL). This task is initiated every five years to ensure that we are maintaining up-to-date governance, consistent with NPSS and IEEE. While this current revision was initiated a few years ago, we have taken our time to go through this process for several reasons. First, with the COVID-19 pandemic, we were forced to have virtual RISC meetings, something that was not well-accommodated in the prior version of the C&BL. Second, NPSS was in the process of updating its own C&BL, so we wanted to ensure that all RISC updates were consistent with any changes made by NPSS. RISC has now approved this revision and we are providing it here for the broader RITC to review and comment on. Per the C&BL, RITC members will have 60 days to comment on this revision prior to it being adopted.

As you may recall, with the cancelation of the in-person 2020 NSS/MIC in Boston, MA, USA, we had intended to return to Boston in 2024. However, with the high demand for conference space after two years, Boston booked all of the potential weeks when we might schedule our conference. The 2024 Organizing Committee, primarily Lorenzo Fabris, Merry Keyser, and Ralf Engels, quickly were able to identify a few alternative venues that meet our requirements and solicited bids from these venues. After careful consideration and a site visit, we have committed to having the 2024 NSS/MIC/RTSD in Tampa, FL, USA.

For completeness, it is worth reminding everyone that 2021 NSS/MIC Organizing Committee has graciously agreed to reconvene for the 2025 NSS/MIC/RTSD (Room-Temperature Semiconductor Detector conference) in Yokohama, Japan – the site where we planned to have the 2021 conference. Finally, we have initiated the site selection process for 2026 with the target of holding the conference in Europe.

Additional Radiation Instrumentation conferences with IEEE sponsorship are continuing to occur and be planned. September 19th – 23rd, 2022, SCINT 2022 was be held in Santa Fe, NM, USA. By all accounts delaying the conference from 2021 to ensure the conference could be held in person resulted in an outstanding technical conference. In addition, the 2023 edition of the Advancements in Nuclear Instrumentation Measurement Methods and their Applications (ANIMMA 2023 – https://animma.com/) will be held in Real Collegio, Italy, June 12th–16th, 2023.

As this will be my final opportunity to provide input for the NPSS Newsletter, I wanted to take this opportunity to say that it has been an honor and a privilege to serve as your RISC Chair for 2021-2022. I hope that we have moved our community forward while navigating these challenging times! I look forward to supporting Srilalan Krishnamoorthy who will be stepping into the Chair role in 2023. And finally, I'd like to thank Chiara Guazzoni for her service to RISC – she is cycling out of serving as the Most-Recent Chair.

Stay safe and be kind to each other!

More information on the Radiation Instrumentation Technical Committee is available at https://ieee-npss.org/technical-committees/radiation-instrumentation/

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RADIATION INSTRUMENTATION TECHNICAL COMMITTEE

CONSTITUTION AND BYLAWS

RITC CONSTITUTION

ARTICLE I - NAME AND OBJECTIVE

Section 1.

The organization shall be known as the Radiation Instrumentation Technical Committee of the IEEE Nuclear and Plasma Sciences Society (NPSS), referred to hereinafter as the RITC.

Section 2.

The RITC shall strive for the advancement of the theory and application of Ionizing Radiation Instrumentation and of its allied arts and sciences and maintenance of high scientific and technical standards among its members.

Section 3.

The RITC shall aid in promoting close cooperation and exchange of technical information among its members and to this end, is responsible (in conjunction with the Nuclear Medical and Imaging Science Technical Committee - NMISTC) for the annual NSS/MIC meetings and other sponsored conferences, shall assist in associated publications of the Transactions on Nuclear Science, provide for peer recognition of individuals, promote a positive image of ionizing radiation instrumentation science and applications, act as liaison between IEEE and other organizations in the area of radiation instrumentation, and otherwise provide for the needs of its members.

ARTICLE II - FIELD OF INTEREST

Section 1.

The field of interest of the RITC is Ionizing Radiation Instrumentation and its applications. The emphasis is on the tools utilized, primarily the radiation sensors, associated electronics, and techniques for processing the measured data. It shall devote itself to publication or other dissemination of original contributions to the theory, design, experiments, educational methods, and applications of Ionizing Radiation Instrumentation. Areas of technical interest will include, but not be limited to, the following:

Section 2.

a) Sensors for detecting and quantifying ionizing radiation, including X-ray, gamma ray, alpha particle, electron (beta particle), positron and neutron radiation as well as products of high energy interactions or nuclear interactions.

b) Sources of ionizing radiation.

c) Analog and digital electronics and data acquisition systems used in conjunction with the components in a) and b).

d) Simulation, data processing and analysis for a) and b).

e) Instrumentation, systems, and applications incorporating the components in a), b), c) and d).

ARTICLE III - MEMBERSHIP

Section 1.

Members of the RITC are those individuals who are members of the IEEE and NPSS having an interest in Ionizing Radiation Instrumentation.

Section 2.

Affiliates may participate in the activities of the RITC as provided by the IEEE Bylaws and subject to the applicable IEEE rules and regulations and to any additional limitations imposed by the NPSS Bylaws.

ARTICLE IV - ADMINISTRATION

Section 1.

The RITC shall be managed by a Radiation Instrumentation Steering Committee (RISC) consisting of elected members-at-large, plus certain ex-officio members as specified herein and in the Bylaws. The number of elected members-at-large shall be fifteen.

Section 2.

a) The terms of office of the elected members-at-large of RISC shall be three years. Members-at-large who have served a full term may not become a member-at-large again until at least one year after the expiration of their term. Election of members-at-large shall be held annually to fill vacancies for the coming year.

b) Any RISC member or subcommittee member may be removed from office if they fail to perform their duties in a manner that is consistent with the best interests of the IEEE, the NPSS, the RITC or the RISC. This prerogative of the RISC should be exercised only in extreme cases and only after due process and consideration as specified in the Bylaws.

Section 3.

a) The affairs of the RISC shall be headed by a Chairperson in accordance with his or her powers and duties as defined hereunder and in the Bylaws. In the event of the Chairperson's absence or incapacity, the Vice-Chairperson, or if the Vice-Chairperson is unavailable, then the Most Recent Past-Chairperson, shall perform the Chairperson's duties.

b) In the event that neither the Chairperson, the Vice-Chairperson, or the Most Recent Past Chairperson is able to take office as prescribed in the Bylaws, or if all are incapacitated or if all offices become vacant, the RISC shall promptly elect an Acting Chairperson from among the members-at-large to assume the duties of Chairperson until either the Chairperson, Vice-Chairperson, or Most Recent Past Chairperson resumes their duties or an election, as prescribed in Section 4 below, is held.

c) The Chairperson shall appoint a Secretary for the RISC. The Secretary need not be chosen from among the members at large.

Section 4.

a) The Vice-Chairperson, who is Chairperson-elect, shall be elected by the voting members of the RISC. The term of office shall be two years as Vice-Chairperson, followed by two years as Chairperson, followed by two years as the Most Recent Past Chairperson. The election of Vice-Chairperson shall be held as defined in the Bylaws.

b) All elected members-at-large presently serving their elected term shall be eligible for election as Vice-Chairperson.

c) If the Vice-Chairperson is required to perform the duties of the Chairperson, the Vice-Chairperson is eligible to become Chairperson when his or her nominal term as Vice-Chairperson is complete.

d) The Chairperson, Vice-Chairperson, and Most Recent Past Chairperson shall be considered ex-officio members of the RISC with voting rights for the duration of their terms in their respective Chairperson positions.

e) Upon assuming their position, the Vice-Chairperson shall forego the remainder of their member-at-large term. A

new member-at-large will fill this position according to the procedure described in Article V, Section 3 below.

Section 5.

The Chairperson, with the concurrence of RISC, shall have the power to create and disband Subcommittees of the RISC, including, but not limited to, those listed in the Bylaws. The Chairperson shall be an ex-officio member with vote on all Subcommittees.

Section 6.

The Chairperson, as soon as possible after assuming this position, shall appoint the Chairpersons of the Subcommittees provided for in the Bylaws.

ARTICLE V - NOMINATIONS AND ELECTION OF RISC MEMBERS-AT-LARGE

Section 1.

Nominating procedures shall be as prescribed in the Bylaws and shall include provision for nomination by RITC members.

Section 2.

Election of the members-at-large of the RISC shall be as prescribed in the Bylaws.

Section 3.

If a member-at-large of the RISC does not complete their term and the term has at least one year remaining, the vacancy shall be filled according to results of the most recent member-at-large election. The first open position being filled by the nominee with the sixth most votes, the second position by the nominee with the seventh most votes, and so on. In the event that all nominees on the ballot of the most recent election have assumed RISC positions, open positions shall be filled at the next election for the unexpired portion of the unfilled position. When a RISC member is appointed for a partial term, that person is eligible to run for the next full-term election to the same position.

ARTICLE VI - MEETINGS

Section 1.

The RISC shall meet as required to conduct business and in accordance with the Bylaws. Meeting of the RISC shall generally follow Robert's Rules of Order.

Section 2.

The RISC or any subcommittee thereof may meet, vote, and take action by any means of concurrent communication. The normal voting requirements for quorum and majority shall apply when action is taken by any means of communications allowing all the persons participating in the meeting to communicate with each other at the same time.

Section 3.

Eleven voting members of the RISC shall constitute a quorum. No member shall have more than one vote by reason of multiple offices or responsibilities.

Section 4.

A majority of the votes cast by those members of the RISC attending a meeting shall be necessary for the conduct of its business except as otherwise provided in this constitution.

Section 5.

The RISC or any subcommittee thereof may take action without a meeting if applicable (e.g., email voting). The results of the vote shall be confirmed promptly in writing or by electronic transmission and recorded at the next RISC meeting.

Section 6.

Proxy voting is not allowed.

ARTICLE VII - AMENDMENTS

Section 1.

Amendments to this Constitution may be initiated by a petition submitted by a two-thirds vote of the RISC, such petition being submitted to the NPSS Administrative Committee (AdCom) for approval. After such approval, the proposed amendment shall be published in the NPSS Newsletter, with notice that it goes into effect unless 20 RITC members object within 60 days of the date of the notice. If such objections are received, a copy of the proposed amendment shall be communicated to all members of the RITC at least 45 days before the date set for the vote. When a vote of the entire RITC membership is made necessary, approval of the amendment by at least two-thirds of the votes shall be necessary for its enactment. If approved by RITC members, the proposed amendment will be submitted to NPSS AdCom for final approval. The amendment shall take effect immediately upon approval by AdCom. If the amendment changes the membership of RISC, the current RISC members will continue to serve until their terms expire.

Section 2.

As an alternative to the procedure outlined in Section 1 above, 10 members of the RITC may submit a petition to RISC. RISC shall consider this petition within 3 months of its submission. If the petitioners are not satisfied with the RISC results, they may escalate the petition to the AdCom. If approved by the NPSS AdCom, AdCom shall notify the RISC. If approved by RISC or AdCom, the proposed amendment shall be submitted to the membership for vote as described above.

Section 3.

RITC Bylaws, and amendments thereto, may be adopted by two-thirds vote of those present at a RISC meeting, provided that notice of the proposed Bylaw or amendment has been sent to each member of the RISC at least a week prior to such meeting. Alternatively, a RITC Bylaw or amendment may be adopted by a two-thirds vote of the members of the RISC, as long as a 3-week period is given for such responses. In either event, the proposed Bylaw or amendment shall be published in the NPSS Newsletter. No Bylaw or amendment shall take effect until it has been approved by the AdCom of the NPSS.

ARTICLE VIII - REVISION

Section 1.

The Chairperson of the RISC shall appoint a subcommittee every five years to evaluate the effectiveness of the Constitution and Bylaws, to study the rules of governance required by the activities of the RITC at that time and to consider revising the Constitution and Bylaws appropriate to the existing and anticipated needs of the RITC.

RITC BYLAWS

1. RISC

Article IV of the Constitution provides that the RISC shall consist of a number of elected members-at-large plus certain ex-officio members. The ex-officio members of the RISC shall be the Chairperson of RISC, the Vice-Chairperson of RISC, the Most Recent Past Chairperson of RISC, the RITC-elected NPSS AdCom members, the Chairperson of each RISC Subcommittee, the Chairperson of the Nuclear Medical and Imaging Sciences Council, the Senior Editor for Radiation Instrumentation of the IEEE Transactions on Nuclear Science, and such other ex-officio members as are provided for in the Constitution and Bylaws of the NPSS.

1.1 The voting members of the RISC shall be the elected RISC members-at-large, the Chairperson of RISC, the Vice-Chairperson of RISC, and the Most Recent Past Chairperson of RISC, and the RITC-elected NPSS AdCom members.

1.2 The RISC shall meet at least once per year within a month of the NSS conference on a date determined by the Chairperson, which should be provided to all of RISC at least three weeks in advance of the meeting. This meeting shall be considered the Annual Meeting of the RISC.

1.3 Additional meetings may be called at the discretion of the Chairperson or upon request of at least two thirds of the voting members of the RISC with at least a three-week notice.

2. Nomination and Election of RISC Members

Article IV of the Constitution specifies the number of RISC members-at-large, as well as the term length and restrictions. One third of the RISC members-at-large, plus any unfilled vacancies created in the previous year, are to be filled each year by election of the general membership of the RITC.

2.1 The Chairperson of the RISC is responsible for ensuring that there are no fewer than 50% more nominations than vacant positions to be filled (for a typical year when there are five vacant positions, this requires a minimum of eight nominees). Nominations may be made by any member of the RISC or any member in good standing of the RITC. Self-nominations are allowed.

2.2 The individual making a nomination must determine in advance that the nominee is willing to serve if elected.

2.3 Those nominees receiving the highest number of votes will be elected to the vacant posts. In the event a tie needs to be resolved, the voting members of RISC shall vote.

2.4 The Chairperson of the RISC shall ensure that a call for nominations is conveyed to the entire RITC membership via the March NPSS Newsletter. Nominations must be submitted to the NPSS Nomination Chairperson by July 1. Such nominations must include an expression by the nominee of willingness to serve if elected.

2.5 All nominees must either be IEEE members (any grade) and members of the RITC or have submitted applications for membership at the time the nominations are forwarded to IEEE Headquarters.

2.6 On or about July 31, RISC, through NPSS and IEEE Headquarters, shall arrange for the distribution of a ballot to the members of the RITC to elect the candidates to fill vacancies on the RISC. The ballot shall be accompanied by a short biographical sketch from each nominee with an indication of their Radiation Instrumentation activities and former or present IEEE activities.

2.7 Forty-five days after distribution of the ballots, the IEEE Headquarters shall count and tabulate the votes received and report the results to the RISC.

2.8 The RISC shall submit to the Secretary of the NPSS AdCom the names of the candidates with the largest number of votes to fill the designated vacancies.

2.9 In the case of a paper ballot being submitted, no members-at-large vote shall be counted unless unambiguously marked by a qualified voter to indicate their choice, and sent in a sealed envelope bearing the voter's name on or before the specified deadline date.

3. Subcommittees

The Chairperson of the RISC, in concurrence with the RISC, shall appoint the Chairpersons for the following Subcommittees:

- Fellows and Awards Subcommittee(s).
- Other Subcommittees as shall be required for the operation of the RITC.

3.1 The term of office of a Subcommittee Chairperson shall be one year, but a Subcommittee Chairperson may be reappointed to the same position.

3.2 The Chairperson of a Subcommittee must be a member of the RITC. However, in general, preference should be given to elected members of the RISC to serve as Chairpersons of its Subcommittees.

3.3 Each of the Subcommittees shall report on its activities to the RISC at the Annual Meeting.

3.4 The membership of the Subcommittees shall be appointed by the Chairperson of that Subcommittee. The membership and activities of the Subcommittees should be publicized to the membership of the RITC via the NPSS Newsletter, and suggestions for Subcommittee membership should be invited from RITC members.

3.5 The Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Joint Oversight Subcommittee (JOS) shall be a joint subcommittee of the RISC and NMISC charged with the primary responsibility of researching future NSS/MIC conference locations and assisting with the selection of the respective General Chairs. The JOS shall be managed by the Joint Executive Subcommittee (JES) of the RISC and NMISC. The detailed responsibilities and operating procedures for the JOS are specified in a separate Terms of Reference document that is managed by the JES.

3.5.1 JOS Membership

The JOS members-at-large are the executive members (JOS Chair, Vice Chair, Most Recent Past Chair) and four elected regular members, two each from RITC and NMISTC. Ex-officio members of the JOS include the RISC Chair, the NMISC Chair, and the NPSS AdCom President. All members-at-large and ex-officio members are voting members. The terms of office for JOS regular members-at-large shall be two years, with a limit of two consecutive terms. The executive member term limit is six years (two years each as Vice Chair, Chair and Most Recent Past Chair). JES members are not eligible to be JOS members, with the exception of the ex-officio positions held by the RISC and NMISC Chairs.

3.5.2 Joint Executive Subcommittee

The Joint Executive Subcommittee (JES) is comprised of the current Chairpersons, the Most Recent Past Chairpersons, and the Vice Chairpersons of the RISC and NMISC. The JES is a subcommittee of and reports to RISC and NMISC. The JES is chaired by the outgoing Most Recent Past Chairperson rotating each year between RISC and NMISC. All actions of the JES are communicated to the committees through the respective RISC and NMISC Chairs. The primary responsibilities of the JES are to provide direction and guidance to the JOS Chair and committee in the execution of their duties, facilitate the communication between the JOS and the RISC and NMISC, and maintain revision control authority for the JOS Terms of Reference and related site selection documents.

3.5.3 Voting

Voting within the JOS concerning site selection can be executed in any form convenient for the committee (electronic or otherwise) and shall be by simple majority. A minimum fifteen-day notification of a vote is required prior to executing a vote. All members-at-large must participate in voting activities and in the event a member-at-large does not register a vote, that member's vote shall be counted as an abstention. In the event of a tie vote, a second vote will be held with only the tied sites. If the vote remains tied, a vote is executed by the JES members and the JOS Chair. Voting members have only one vote, regardless of the number of voting member positions held. Administration of these voting activities shall be the responsibility of the JOS Chair.

3.5.4 Communication

JOS internal communication can take any form (e.g., electronic or in-person). Records of all communications shall be retained in the JOS archive, the maintenance of which is the responsibility of the JOS Chair.

3.5.5 Election of JOS Members

3.5.5.1 The Vice Chair of the JOS shall be elected biennially, alternating between the RISC and NMISC. The Vice Chair shall become the Chair at the end of the term, the Chair becoming the Most Recent Past Chair.

3.5.5.2 Two of the four regular elected members-at-large shall be either appointed or elected (at the chair's discretion) annually, one each by RISC and NMISC, so that the terms of the elected committee members-at-large overlap by one year.

3.5.5.3 If any member does not complete their term, a new member will be selected as soon as possible

to complete the unexpired portion of the term from the committee originally responsible for selecting the departing member (RISC or NMISC). In such cases, the replacement member-at-large can subsequently be elected for up to two additional 2-year terms.

3.5.5.4 In the event that the JOS Chair is vacated for any reason, the JOS Most Recent Past Chair shall immediately assume the position of JOS Chair for the duration of the term. The replacement JOS Chair may then once again become the JOS Most Recent Past Chair as an exception to the term limit rules (paragraph 3.5.1) if approved by the JES, otherwise the JOS Most Recent Chair position will remain vacant until the replacement JOS Chair completes their term, who then becomes the Most Recent Past Chair. If the JOS Most Recent Past Chair is unavailable, the JOS Vice Chair assumes the duties of JOS Chair for the remainder of the term, and then begins their elected term. In this case, election of a new JOS Vice Chair shall immediately commence.

3.5.5.5 In the event that the JOS Chair is removed from office, he/she is not eligible to assume the duties of the Most Recent Past Chair. The term of the current Most Recent Past Chair can be extended by the JES, or will remain vacant until the replacement JOS Chair completes their term, who then becomes the Most Recent Past Chair.

3.5.6 Conflict of Interest

3.5.6.1 Any JOS or JES member who has a conflict of interest (COI) in the site selection decision for a particular year shall be recused from the vote for that year. The COI can be in the form of either financial or personal gain as a result of the site selection. COI determinations shall be consistent with current IEEE policy. The COI may be self-declared, or arise from a suggestion of potential COI from any member of the NMISTC or RITC. In the latter case, the decision on whether an actual COI exists will be made by the JOS Chair, unless he or she is the member in question, in which case the decision will be made by the JES.

3.5.6.2 A COI with respect to voting exists for any JOS or JES member who is also a member of the local organizing committee for a site under consideration prior to the vote. Once a site is selected, JOS and JES members may become conference organizing committee members.

4. Voting

All calls for vote, pursuant to action by the RISC, shall be issued to the voting members by the Secretary. The Secretary shall report the results to the RISC.

5. Beginning of Terms of Office

All terms of office of elected Members-at-Large of the RISC shall begin January 1 of the year immediately following their election.

6. Election of Vice-Chairperson of RISC

The Vice-Chairperson of RISC shall be nominated and elected from among the eligible members-at-large of the RISC. A minimum of one month before the Annual Meeting of the RISC, the RISC Secretary will notify all current RISC members of the upcoming election and solicit nominations (self-nominations are allowed). The nominations will be closed two weeks before the annual meeting of the RISC. The Chairperson of the RISC is responsible for ensuring that at least one nomination for Vice-Chairperson is received by this time. The Secretary of RISC shall announce to all voting RISC members the identities of the candidates at least one week before the annual meeting, and also inform them of the procedure for casting a ballot if they are unable to attend the RISC annual meeting. The vote will occur during the Annual Meeting of the RISC. If there is only one candidate, then that candidate will be elected at the Annual Meeting by those RISC members in attendance. If there is more than one candidate, a secret ballot will be taken during the Annual Meeting and the Chairperson shall designate tellers to immediately count the ballots. Voting RISC members who are not attending the Annual Meeting of the RISC may submit a ballot by notifying the RISC Secretary of their choice. The results of the vote shall be announced and the nominee receiving a majority of votes cast shall be declared elected. In the event that no candidate receives a majority of votes cast, runoff elections shall be conducted by secret ballot at the Annual Meeting of RISC among the candidates receiving the two highest number

of votes until one candidate receives a majority of the votes cast. For these runoff elections, only those RISC members in attendance may cast a vote. The terms of office of the Chairperson, Vice-Chairperson and Most Recent Past Chairperson of RISC shall begin January 1 of the year immediately following their election.

7. Removal from Office

7.1 Any directly elected member who misses three successive meetings shall be automatically dropped from RISC, unless the Chair or RISC waives this provision for good cause. The member who is removed shall be so notified by the Secretary.

7.2 In order for a member of the RISC or a RISC Subcommittee member to be removed from office, a petition signed by a minimum of five voting RISC members is necessary to initiate the removal process. The petition must include the name of the member to be removed, the position in question, and a description of the grounds for removal. Upon receipt of the petition, the Secretary will notify all RISC members that such a petition has been received, notify the member in question, and give that member 30 days to provide a written response. After this period, the Secretary will send a ballot that includes the statement of the grounds for removal and its rebuttal to each voting RISC member. The ballots will be returned to the Secretary who will tally the votes within 30 days after the ballots were sent. A minimum of two-thirds vote is required to remove the member from office. In the event that the Secretary is the member in question, the Chairperson will designate an alternate RISC member to perform these duties. If the Chairperson or Vice-Chairperson is removed from office, an election will be held within 30 days to select a new Chairperson or Vice-Chairperson according to the rules listed in the Bylaws for the election of the Vice-Chairperson.

8. Open Business Meeting

When the annual IEEE Nuclear Science Symposium and Medical Imaging Conference is held in person, an open business meeting of the RITC shall be held.

Disruptive visitors can be removed from Open Business meetings at the discretion of the meeting's presiding officer. Should RISC meet in Executive Session, any visitor present may be asked to leave.

9. Records

The Secretary shall maintain a permanent record of all non-routine motions passed by the RISC, and provide a tabulation of the most recent five years of motions and a copy of the RITC Constitution and Bylaws to each newly elected member-at-large to the RISC.

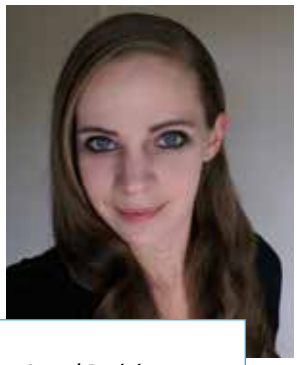
Functional Committees

AWARDS

Announcing 2022 TPS Best Paper Award

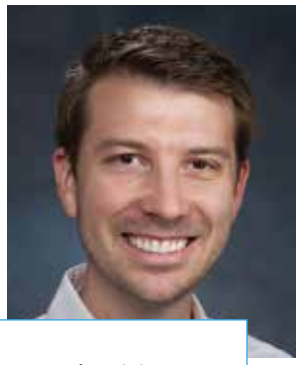
The winner of the 2022 TPS Best Paper Award has been selected (please refer to our TPS home page for details about the award at https://ieee-npss.org/publications/transactions-on-plasma-science/). This year is the fourth year that the award is being given, and I am pleased to announce that this year's winner is the paper, *Transfer Learning to Model Inertial Confinement Fusion Experiments*, published in *IEEE Transactions on Plasma Science, 48:1, pp 61-70, January 2020*. The four co-authors of this paper are Kelli Humbird, J. Luc Peterson, and Brian K. Spears all from the Lawrence Livermore National Laboratory, Livermore, California USA and Ryan G. McClarren from the University of Notre Dame, Notre Dame, Indiana USA. The abstract of the paper and the photos and biosketches of the co-authors are given below. The award plaques, certificates and award checks have been sent to the co-authors by IEEE. This paper has been made freely available to all our readers. Congratulations to the team of co-authors Kelli Humbird, J. Luc Peterson, Brian K. Spears, and Ryan G. McClarren on this accomplishment.

ABSTRACT: Inertial confinement fusion (ICF) experiments are designed using computer simulations that are approximations of reality and therefore must be calibrated to accurately predict experimental observations. In this article, we propose a novel technique for calibrating from simulations to experiments, or from low fidelity simulations to high fidelity simulations, via "transfer learning" (TL). TL is a commonly used technique in the machine learning community, in which models trained on one task are partially retrained to solve a separate, but related task, for which there is a limited quantity of data. We introduce the idea of hierarchical TL, in which neural networks trained on low fidelity models are calibrated to high fidelity models, then to experimental data. This technique essentially bootstraps the calibration process, enabling the creation of models which predict high fidelity simulations or experiments with minimal computational cost. We apply this technique to a database of ICF simulations and experiments carried out at the Omega laser facility. TL with deep neural networks enables the creation of models that are more predictive of Omega experiments than simulations alone. The calibrated models accurately predict future Omega experiments, and are used to search for new, optimal implosion designs.



Kelli D. Humbird
2022 TPS Best Paper Award Recipient

Kelli D. Humbird received a Ph.D. in Nuclear Engineering from Texas A&M University, College Station, TX in 2019. She is currently a physicist with Lawrence Livermore National Laboratory, Livermore CA, where she works in the inertial confinement fusion program. Her scientific contributions include machine learning analysis of high energy density science experiments, design optimization, machine learning acceleration of Multiphysics codes, and uncertainty quantification.



J. Luc Peterson
2022 TPS Best Paper Award Recipient

J. Luc Peterson received the Ph.D. degree in plasma physics from Princeton University, Princeton, NJ, USA, in 2011. He is currently a Physicist and a Group Leader with the Lawrence Livermore National Laboratory, Livermore, CA, USA, where his scientific contributions include theoretical and computational studies of inertial confinement fusion, hydrodynamic instabilities, radiation transport, hohlraum symmetry, uncertainty quantification, data analytics, high-frequency computing, and machine learning. He is also leading the Merlin Project, which aims to augment computational and experimental workflows with machine learning.

Brian Spears
2022 TPS Best Paper Award Recipient

Brian Spears is a physicist at Lawrence Livermore National Laboratory (LLNL). He is a principal architect of cognitive simulation methods–artificial intelligence (AI) methods that combine high-performance simulation and precision experiments with the goal of improving model predictions. He is also the Director of the LLNL AI Innovation Incubator, AI3. AI3 develops strong public-private and academic partnerships on collaborative research projects that are steering the LLNL AI strategy. In his personal research, he applies cognitive simulation techniques to stockpile stewardship missions with emphasis on quantifying uncertainty in inertial confinement fusion (ICF) experiments and advancing certification methods for the US nuclear weapons stockpile. He also uses cognitive simulation research applications to guide development of next-generation supercomputers. His responsibilities include setting vision for AI development and deployment at the Laboratory while driving LLNL leadership in AI for science.

He has designed ICF experiments for 18 years, including the first cryogenic layered experiments at the National Ignition Facility. He developed new ICF ignition metrics using the first large-scale ensembles of 2D ICF simulations. He received the LLNL Mid-Career Recognition for career achievements in research and the Hyperion HPC Innovation Award. Brian completed his Ph.D. at the University of California, Berkeley where he studied topological methods for high-dimensional dynamical systems. He also holds a BS in mechanical engineering and a BA in liberal arts from the University of Texas at Austin. When not doing science, he can be found racing his bike or chauffeuring his two daughters to swim practice.

Ryan McClarren
2022 TPS Best Paper Award Recipient

Ryan McClarren received the Ph.D. degree from the University of Michigan at Ann Arbor, Ann Arbor, MI, USA, in 2007. He is currently, Associate Professor of Aerospace and Mechanical Engineering at the University of Notre Dame. His work applies simulation to

understand, analyze, and optimize engineering systems. He has authored numerous publications in refereed journals on machine learning, uncertainty quantification, and numerical methods, as well as three scientific texts: *Machine Learning for Engineers, Uncertainty Quantification and Predictive Computational Science: A Foundation for Physical Scientists, and Engineers and Computational Nuclear Engineering and Radiological Science Using Python*. He was recently named Editor-in-Chief of the *Journal of Computational & Theoretical Transport*. Prior to joining Notre Dame in 2017, he was Assistant Professor of Nuclear Engineering at Texas A&M University, and previously a research scientist at Los Alamos National Laboratory in the Computational Physics and Methods group.

2022 IEEE/NPSS Radiation Effects Award

Michael Xapsos, NASA GSFC, received the 2022 IEEE/NPSS Radiation Effects Award.

Mike Xapsos
2022 Radiation Effects Award Recipient

Teresa Farris
RE Vice Chair, Publicity

Mike Xapsos joined the Radiation Effects and Analysis group at NASA Goddard Space Flight Center in 2001, where he oversaw its space radiation environment work and supported space flight and research programs until retirement from full time work in 2018. His work has been used for many NASA missions, including the James Webb Space Telescope, Hubble Space Telescope, Solar Dynamics Observatory and Magnetospheric Multiscale Mission. He was the Project Scientist for the Living With a Star (LWS) Space Environment Testbed (SET), responsible for the mission scientific objective of improving the performance of space hardware. Prior to that he worked in the Radiation Effects Branch of the Naval Research Laboratory as a research physicist, investigating the space radiation environment and its effects at the device level. He received the B.Sc. degree in physics and chemistry from Canisius College in 1978 and the Ph.D. degree in physics from the University of Notre Dame in 1985.

Mike led the development of the ESP/PSYCHIC solar particle event models that are widely used for spacecraft design requirements. He is the recipient of the NASA Exceptional Engineering Achievement Medal. He presented Short Courses for the Radiation Effects on Components and Systems (RADECS) Conference, Hardened Electronics and Radiation Technology (HEART) Conference, and for the Nuclear and Space Radiation Effects Conference (NSREC) twice. He was lead author of an NSREC Outstanding Paper Award and a RADECS Outstanding Conference Oral presentation. He has been an editor of the *IEEE Transactions on Nuclear Science* NSREC issue and held various positions for the NSREC including Conference Chair and Technical Program Chair. He has authored or co-authored over 100 technical publications.

Citation: *For contributions to the understanding of space radiation environments and their interactions with microelectronics.*

Radiation Effects Nominations for 2023 Awards

Nominations are due January 27th, 2023, for awards that will be presented at the IEEE NSREC 2023 Conference, July 24th–28th, in Kansas City, Missouri.

Radiation Effects Award Nominations

Nominations are currently being accepted for the 2023 IEEE Nuclear and Plasma Sciences Society (NPSS) Radiation Effects Award. The purpose of the award is to recognize individuals who have had a sustained history of outstanding and innovative technical and/or leadership contributions to the radiation effects community. The $3000 cash award and plaque will be presented at NSREC 2023, Kansas City, Missouri. Forms are available electronically at http://ieee-npss.org/technical-committees/radiation-effects/ and must be submitted by January 27th, 2023. Additional information can be obtained from Rubén Garcia-Alia, Senior Member-at-Large, CERN, for the Radiation Effects Steering Group. Ruben can be reached at ruben.garcia.alia@cern.ch

Radiation Effects Early Achievement Award Nominations

Nominations are currently being accepted for the 2023 Radiation Effects Early Achievement Award. The purpose of this award is to recognize an individual early in his or her career whose technical contributions and leadership have had a significant impact on the field of radiation effects. The $1500 cash award and plaque will be presented at NSREC 2023 in Kansas City, Missouri. Forms are available electronically at http://ieee-npss.org/technical-committees/radiation-effects/ and must be submitted by January 27th, 2023. Additional information can be obtained from Rubén Garcia-Alia, Senior Member-at-Large, CERN, for the Radiation Effects Steering Group.

Rubén can be reached at ruben.garcia.alia@cern.ch

Paul Phelps Continuing Education Grant Nominations

Nominations are currently being accepted for the 2023 Paul Phelps Continuing Education Grant. The purpose of the grant is to promote continuing education (attendance at the 2023 NSREC Short Course) and encourage membership in NPSS. Outstanding members of NPSS who are either Student Members, Post-Doctoral Fellows or Research Associates, or unemployed members needing assistance in changing career direction can be nominated for the award. The actual amount of the grant will be determined prior to the 2023 NSREC in Kansas City, Missouri. Funds are to be used towards covering travel costs to attend the NSREC Short Course. The grant also provides complimentary short course registration.

Nomination forms are available electronically at http://ieee-npss.org/technical-committees/radiation-effects/ and must be submitted by January 27th, 2023. Additional information can be obtained from Mike Tostanoski, Member-at-Large, Radiation Test Solutions, for the Radiation Effects Steering Group. Mike can be reached at mtostanoski@radiationtestsolutions.com

NSREC 2023 Short Course, Kansas City, Missouri

The Short Course Chair is Ethan Cannon, The Boeing Company. The theme of the 2023 course is "Radiation Considerations for Board-Level Computing Systems."

Presentations and speakers for the four sessions are:

- *Advancements and Challenges with Radiation-Tolerant Spaceflight Computers*, Tyler Lovelly, U.S. Air Force Research Laboratory
- *Radiation effects in FPGAs and SoCs*, Nadia Rezzak, Microchip Technology, & Pierre Maillard, AMD

» *Radiation effects in data links*, Zac Diggins, Cyclo Technologies

» *Experimental Evaluation of Artificial Neural Networks Reliability: from GPUs to Low-Power Accelerators*, Paolo Rech, University of Trento, UFRGS

For mor information about the Radiation Effects Committee and its conference and awards, contact Teresa Farris, Vice Chair for Publicity, by E-mail at teresa.farris@archon-llc.com.

IEEE NPSS FOUNDATION FUND

Many Small Donations Add Up

This is a suggestion that you consider taking a moment and make a small donation to the Nuclear and Plasma Sciences Society Fund at the IEEE Foundation. This fund, recently established, is to give the Society much greater flexibility and resources for mainly educational outreach. This can be direct support of students, or expanding the range of focused summer schools like the Instrumentation Summer Schools that have been such a great success in Asia and Africa over the last six years, or new educational initiatives not yet defined. Current IEEE rules force us to change the funding support for these schools after three years and that is where the Foundation Fund comes in.

In order to make transfers into the fund from NPSS operational accounts, IEEE rules require that we not only seek but also get donations from individuals. Thus, your donation, however small, will at least be doubled.

So, head on over to ieeefoundation.org/donate and select "Nuclear and Plasma Sciences Fund" from the drop-down designation box. Remember that for US tax-payers this donation is counted as a charitable donation.

For more information contact Roger Fulton at roger.fulton@sydney.edu.au or Peter Clout at p.clout@ieee.org.

Roger Fulton
Foundation Fund Chair

Peter Clout
Communications Chair

Articles
Snowmass'21

PARTICLE PHYSICS AND ACCELERATOR COMMUNITY PLANNING EXERCISE

This past July was an exciting time for the U.S. high energy physics community. The Snowmass Community Summer Study Workshop has taken place in Seattle on July 17th–26th and was the culmination of the various workshops and Town Hall meetings that have taken place during 2020, 2021, and 2022 as part of Snowmass'21.

Snowmass is a particle physics community study that takes place in the U.S. every 7-9 years (the last one was in 2013). The Snowmass'21 study (the name is historical, originally it was held in Snowmass, Colorado) is organized by the Divisions of Particles and Fields (DPF), Beam Physics (DPB), Nuclear Physics (DNP), Astrophysics (DAP) and Gravitation (DGRAV) of the American Physical Society. The Snowmass'21 study strives to define the most important questions for the field and to identify promising opportunities to address them. It provides an opportunity for the entire particle physics community to come together to identify and document a scientific vision for the future of particle physics in the U.S. and its international partners. The P5 (Particle Physics Project Prioritization Panel), chaired by Hitoshi Murayama (UC Berkeley), will take the scientific input from the Snowmass'21 (final summaries published in September 2022) and by the Spring of 2023 develop a strategic plan for U.S. particle physics that can be executed over a 10-year timescale, in the context of a 20-year global vision for the field.

Snowmass'21 activities are managed along the lines of ten Frontiers: Energy Frontier (EF), Neutrino Physics Frontier (NF), Rare Processes and Precision Frontier (RPF), Cosmic Frontier (CF), Theory Frontier (TF), Accelerator Frontier (AF), Instrumentation Frontier (IF), Computational Frontier (CompF), Underground Facilities (UF), Community Engagement Frontier (CEF). About 1400 people have taken part in the Seattle workshop, among them some 750 in-person attendees and about 20 INFN scientists. In general, the particle accelerator community was very well represented and over 100 scientists and engineers from world-leading accelerator labs and groups have been either organizers of sessions and events, or conveners of topical groups, or submitted numerous Letters of Interest (short communications) or White Papers (extended input documents).

Vladimir Shiltsev
Co-convenor

As a co-convener of the Snwomass'21 "Accelerator Frontier" (together with Steve Gourlay of LBNL and Tor Raubenheimer of SLAC/Stanford) here I would like to emphasize several important outcomes of the Snowmass process:

» Broadly discussed were elements of the LBNF/DUNE Phase II of the world leading neutrino experiment. There is a broad array of accelerator and detector technologies and expertise to design and construct a 2.4 MW beam power upgrade of the Fermilab accelerator complex for Neutrino Frontier studies, expand the volume of Liquid Argon detectors by 20

Snowmass'21

Cont. from PAGE 19

ktons, and build a new neutrino near-detector on Fermilab site.

» Several possibilities for Rare Processes Frontier (searches for axion, charged lepton flavor violation, dark matter) have been identified that call for broad use of existing and future accelerator facilities, such as SLAC 4-8 GeV electron linac, Fermilab's PIP-II proton linac beam, etc.

» The Energy Frontier community calls for active program toward post-LHC colliders – Higgs/EW factories and O(10 TeV/parton) center-of-mass energy machines. More than 30 collider concepts have been comparatively evaluated by the Implementation Task Force chaired by Thomas Roser of BNL. In Seatlle, clearly identified was the need an integrated future collider R&D program (a focused R&D program in the US DOE Office of HEP) to engage in the design and to coordinate the development of next generation collider projects such as: FCC-ee (circular collider), C3/HELEN/CLIC (linear Higgs factory colliders, the first two fitting Fermilab site), multi-TeV Muon Collider, FCC-hh, to make them ready for an informed choice by the next Snowmass/P5 ca. 2030. The proposal of such a program will need to be approved by the P5.

» The U.S. have an active R&D program in labs and universities aimed at general accelerator R&D (GARD) and detectors that are critical in developing accelerator science and experimental technologies for future HEP accelerators (RF, magnets, beam physics, advanced concepts, targets & sources, beam physics, etc.).

» We need to strengthen and expand education and training programs, enhance recruiting (especially international talents), promotion of the field (e.g., via colloquia at universities), enhance support to national undergraduate recruiting class to bring more women and talents from underrepresented minorities.

Vladimir Shiltsev–Distinguished Scientists at Fermi National Accelerator Laboratory near Chicago (USA) and IEEE Fellow, Prof. Dr. Shiltsev is a world renown expert in particle accelerators and recipient of many awards, including EPS Accelerator Prize and IPAC Nishikawa Prize. He is an honorary member of several professional societies and Foreign Corresponding Member of the Bologna Academy of Sciences. He is past chair of the APS DPB and co-convener of the Snowmass'21 Accelerator Frontier. He can be reached by E-mail at shiltsev@fnal.gov.

Celebrating Emilio Gatti's Centenary

The 100th anniversary of the birth of Professor Emilio Gatti (1922–2016) falls in 2022. He was a pioneer of Nuclear Electronics and one of the founders of this discipline in Italy. He made several seminal contributions to the field such as the invention, together with Pavel Rehak, of the Silicon Drift Detector (which remains the key detector for spectroscopic applications after four decades), the charge preamplifier and the sliding scale correction for analog to digital converters. An overview of his achievements can be found the special issue of the IEEE Solid-State Circuits Magazine (2012, vol. 4, no. 3) published for his 90th birthday.

In order to celebrate this important anniversary, especially addressing young generations, colleagues at Politecnico di Milano have organized, with the support of the NPSS Italy Chapter, a series of events. The first event was held on May 11th in Milano: a instructional session entitled "100 years in 100 minutes" presented the key ideas of Professor Gatti with lectures by Professors Giuseppe Bertuccio, Chiara Guazzoni, Marco Sampietro, Marco Carminati and Carlo Fiorini, all belonging to the group founded by Gatti at Politecnico di Milano.

A second national event was held in Calabria on September 7th with a Special Session opening the 53rd annual meeting of the Italian Association of Electronics (SIE), grouping all Italian researchers in Electronics. This section featured invited talks by Michael Campbell (CERN), Giuseppe Bertuccio and Marco Carminati (Politecnico di Milano), Gian-Franco Dalla Betta (University of Trento), Lodovico Ratti (University of Pavia) and Massimo Manghisoni (University of Bergamo).

[Photo: Gatti Remembrance speakers (group)]

Finally, a third event will take place in Milano on November 11th during the IEEE NSS MIC RTSD conference in the form of a workshop including the award ceremony of the Emilio Gatti and Franco Manfredi Best Ph.D. Thesis Award in Radiation Instrumentation organized by the NPSS Italy Chapter.

Marco Carminati, author of this remembrance, can be reached by E_mail at marco1.carminati@polimi.it.

Marco Carminati
Gatti Remembrance author

Group photo of the speakers at the Special Session on Nuclear Electronics celebrating Emilio Gatti at the 2022 meeting of the Italian Association of Electronics (SIE).

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CONTRIBUTED ARTICLES

Publicity releases for forthcoming meetings, items of interest from local chapters, committee reports, announcements, awards, or other materials requiring society publicity or relevant to NPSS should be submitted to the Newsletter Editor no later than January 5th, 2023 for inclusion in the March 2023 Newsletter..

News articles are actively solicited from contributing editors, particularly related to important R&D activities, significant industrial applications, early reports on technical breakthroughs, accomplishments at the big laboratories and similar subjects. The various *Transactions*, of course, deal with formal treatment in depth of technical subjects. News articles should have an element of general interest or contribute to a general understanding of technical problems or fields of technical interest or could be assessments of important ongoing technical endeavors.

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