

Join us in Vancouver, B.C



November 4th to 11th

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2023 IEEE Nuclear Science Symposium, Medical Imaging Conference, and Symposium on Room-Temperature Semiconductor X-Ray and Gamma-Ray Detectors (NSS/MIC/RTSD)

Dear Colleagues,

The 2023 IEEE Nuclear Science Symposium (NSS) and Medical Imaging Conference (MIC) together with the Symposium on Room-Temperature Semiconductor X-ray and Gamma-ray Detectors (RTSD) will be held at the Vancouver Convention Center, Vancouver, B.C from November 4th to 11th. This conference is the premier meeting on the use of instrumentation in the Nuclear and Medical fields. World experts in the fields of nuclear science, radiation instrumentation, software engineering and data acquisition gather during the NSS. The MIC has its primary focus on the state-of-the-art use of physics, engineering, and mathematics in nuclear medicine and increasingly so in multi-modality and hybrid imaging including CT and MRI. The RTSD is a good complement to both the NSS and MIC segments of the conference as it impacts both interest areas with its focus on compound semiconductor radiation detectors.

Many fundamental discoveries have been catalyzed by the unique synergistic and interdisciplinary aspect of this conference; collectively the three main areas span topics from instrumentation development to its use in bettering human health and advancing basic physics knowledge. Coordination among sessions of the three main areas has been carefully planned, and several joint sessions will feature papers that are of most relevance to all the communities. This will further foster cross-fertilization between different areas of expertise, which increasingly reflects the trends and needs of state-of-the-art research and maximizes its present and future impact on a broader societal level.

In order to stress the innovative and forward-looking aspects of the conference, this year we are planning a new joint session featuring the theme: 'Future directions: from roadmaps to standards.' We are selecting three

CONFERENCES Cont. from PAGE 1

'visionary' speakers who will present their views on the opportunities and needs facing our fields of expertise in the context of the rapidly evolving technology and its impact on society. The session, which will include a round-table discussion, will be mediated by senior IEEE academic and industry experts, thus providing the event with an even broader framework. This, hopefully vibrant and thought-provoking session, will be held on Tuesday afternoon, just before the exhibitor reception, where there will be opportunities for further networking. A large area has been reserved for the exhibitors to have ample space for mingling and discussions from Tuesday, Nov 7th to Thursday, Nov 9th. Exhibitors have always been a very important aspect of our meeting - not only from the commercial point of view, but also as catalyzers of exchange between Academia and the commercial world with ultimate benefits to both. At the time of writing, 57 booths have already been sold and we are expecting more.

As customary, the NSS sessions will run from Monday morning until Friday noon and the MIC sessions will be held from Tuesday noon until Saturday noon. RTSD sessions will run from Monday morning until Thursday afternoon; the complete schedule will be on the web and app in August.

We will be featuring eight short courses and four workshops. The short courses were designed to ensure coverage of more fundamental and novel topics: Real-time machine learning on FPGAs; Fast timing detectors and readout; Integrated circuits for detector signal processing and radiation hardened design; Basics of radiation detection; Medical image reconstruction: from foundations to AI; PET kinetic modeling and parametric imaging; GATE, a Monte Carlo simulation platform for imaging and therapy; Artificial intelligence in nuclear medicine image analysis and processing. The themes of the workshops were selected based on current research needs and by identifying research efforts that have a high chance to evolve into major research areas in the very near future: The Digital SiPM Revolution: Opportunities, New Detector Concepts and Networking (SPAD); Open Kinetic Modeling Initiative; Young Investigators' Workshop (YIWS); and Ultra-low-dose PET Imaging.

A new feature this year was the request for a copyright form at the time of abstract submission. This will enable early publication of the submitted Abstracts in IEEE Xplore, which will serve as a record of the conference proceedings. This was done to ensure a timely dissemination of the general conference content and proof of presentation, while minimizing

potential concerns about scientific publication duplication as a consequence of the brevity of the abstracts.

The scientific part of the meeting will be complemented by the social events, including Women in Engineering (WIE) and Young Professionals (YP) events. We will have exceptional plenary speakers who were selected observing our society adherence to the IEEE WIE pledge ('IEEE WIE pledges to work towards gender-diversified panels at all IEEE meetings, conferences, and events, including our own'): Jae Sung Lee, Sabrina Nagel and Katherine Pachal for NSS; François Bénard and Anca Constantin for MIC; Paul Sellin for RTSD and Dava Sobel for WIE.



Vesna Sossi
General Chair



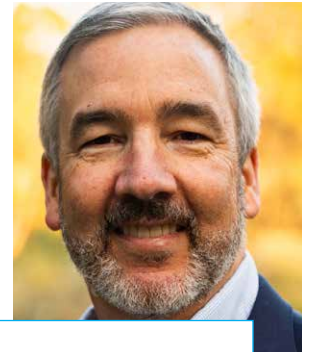
John Lewellen
Deputy General Chair



Ralf Engels
Conference Coordinator, Local Arrangements

Student participation in this meeting is of fundamental, mutually beneficial importance: students learn from senior mentors, while ensuring continued leadership in the field. One hundred fifty (150) Trainee Travel grants have been made available to students to facilitate participation. We are encouraging them to take special advantage of the forward-looking session of the conference, and of the networking events available through the YP, WIE and workshop sessions. Several awards (for a full list please refer to the [conference website](#)) will be presented at this meeting; this will give the opportunity to honor those individuals in our community who have or are expected to contribute significantly to bringing our collective field forward with new ideas and achievements.

Following last year's success, livestreaming of the Plenary Session will be open to anyone so that any



John Valentine
NSS co-chair



Audrey Corbeil Therrien
NSS co-chair



Margaret Daube-Witherspoon
MIC co-chair

interested individual will be able to enjoy the opening of the 2023 meeting. The rest of the meeting, including short courses, will also be livestreamed via Live Stream, but available only to registered participants. The recorded sessions will be made available to registered participants until December 2023. All poster presenters will upload their posters into the system, with a corresponding video, which will also be available later to registered participants. This year we will be able to host virtual oral presentations via Zoom in case a presenter may not be able to travel to Vancouver for emergency reasons.

And of course, it is also very important to enjoy our time together to relax and to brainstorm (some of the best ideas have been generated while sharing a meal). The venues for the social events have been chosen: the RTSD luncheon will be held in the Pinnacle, a

revolving top floor restaurant with 360° views of the city and the mountains (and we'll keep our fingers crossed for blue skies). The NSS dinner will take place at the Science World, while the MIC dinner attendees will be able to explore different varieties of marine inhabitants while enjoying their food in the Vancouver Aquarium.

Travel information and much more detailed information is available on the conference webpage. We encourage you to check it on a regular basis for updates. The committee has been working hard to ensure a vibrant and forward-looking meeting with an outstanding scientific program.

On behalf of the entire organizing committee I am very much looking forward to seeing you in Vancouver.

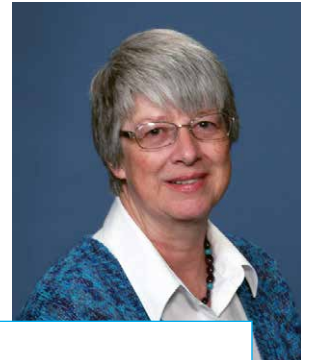
Vesna Sossi, General Chair, can be reached by E-mail at vesna@phas.ubc.ca or by phone at +1 604 822 7710.



Rutao Yao
MIC co-chair



Andrew Goertzen
Treasurer



Merry Keyser
Scholarship co-chair



Ralph James
RTSD co-chair



Youngho Seo
Short Course and Publication Chair



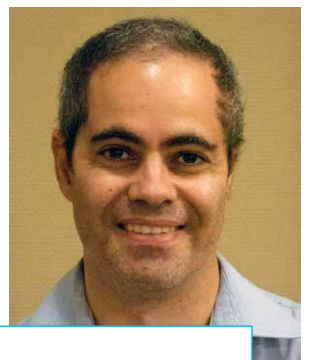
Lucca Caucci
Computer Room



Michael Fiederle
RTSD co-chair



Lorenzo Fabris
Scholarship co-chair



Dean Cutajar
Computer Room

2024 IEEE NSREC Is Planning for Ottawa, Canada

22nd – 26th July 2024



Chair Heather Quinn invites you to NSREC 2024, to be held at the Westin Ottawa with the adjoining Shaw Centre, July 22nd – 26th 2024. Ottawa is Canada's capital, a dynamic showcase city of more than one million people. Located in Ontario at the Quebec border, it's a place where you'll hear English and French spoken in the streets; where you can discover Canada's proud heritage at impressive national sites and famous landmarks, including the Rideau Canal, a UNESCO World Heritage Site. It's a city steeped in culture, with world-class museums and galleries displaying stunning national collections and special exhibitions from Canada and around the world. This city is a uniquely beautiful place: an urban center on the edge of nature where you can enjoy the great outdoors either just outside your hotel room or nearby in the surrounding countryside.

There's an easy cosmopolitan vibe here, and Ottawa is known for being both welcoming and walkable. Explore the distinctive local neighborhoods, including the historic ByWard Market: by day this area boasts a bustling farmers' market and chic shops, by night it hums with activity at the restaurants, pubs, and nightclubs.

This is also a city that enjoys the finer things in life, with a culinary community that's earning wide acclaim, unique boutiques and shopping districts, a lively local music and art scene, and always exciting nightlife. The Westin Ottawa is ideally located right downtown, mere steps away from the historic sites and landmarks, and only a short drive from Ottawa's international airport.

This is Ottawa, Canada's capital. Please join us for NSREC 2024 and experience it for yourself. Please visit the [NSREC website](https://www.nsrec.com) for 2024 conference details and travel planning tips.

TECHNICAL PROGRAM

Chaired by William Robinson, Georgia Tech Research Institute, papers to be presented at this meeting will describe the effects of space, terrestrial, or nuclear radiation on electronic or photonic devices, circuits, sensors, materials and systems, as well as semiconductor processing technology and techniques for producing radiation-tolerant devices and integrated circuits. The conference will be attended by engineers, scientists, and managers who are concerned with radiation effects.

The conference committee is soliciting papers describing significant new findings in the following or related areas:

BASIC MECHANISMS OF RADIATION EFFECTS IN ELECTRONIC MATERIALS AND DEVICES

- » Single Event Charge Collection Phenomena and Mechanisms
- » Radiation Transport, Energy Deposition and Dosimetry
- » Ionizing Radiation Effects
- » Materials and Device Effects
- » Displacement Damage
- » Processing-Induced Radiation Effects

RADIATION EFFECTS ON ELECTRONIC AND PHOTONIC DEVICES AND CIRCUITS

- » Single Event Effects
- » MOS, Bipolar and Advanced Technologies
- » Isolation Technologies, such as SOI and SOS
- » Optoelectronic and Optical Devices and Systems
- » Methods for Hardened Design and Manufacturing
- » Modeling of Devices, Circuits and Systems
- » Cryogenic or High Temperature Effects
- » Novel Device Structures, such as MEMS and Nanotechnologies
- » Techniques for Hardening Circuits and Systems

SPACE, ATMOSPHERIC, AND TERRESTRIAL RADIATION EFFECTS

- » Characterization and Modeling of Radiation Environments
- » Space Weather Events and Effects
- » Spacecraft Charging
- » Predicting and Verifying Soft Error Rates (SER)

HARDNESS ASSURANCE TECHNOLOGY AND TESTING

- » New Modeling and Testing Techniques, Guidelines and Hardness Assurance Methodology
- » Unique Radiation Exposure Facilities or Novel Instrumentation Methods
- » Dosimetry

NEW DEVELOPMENTS OF INTEREST TO THE RADIATION EFFECTS COMMUNITY

RADIATION EFFECTS DATA WORKSHOP

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

PAPER SUBMITTAL

Information on the submission of summaries to the 2024 NSREC for either the Technical Sessions or the Data Workshop can be found at www.nsrec.com. The deadline for submitting summaries is February 2nd, 2024.

SHORT COURSE

Attendees will have the opportunity to participate in a one-day Short Course on Monday, July 22nd. The short course is being organized by Vincent Goiffon, ISAE-SUPAERO. The course will be of interest both to radiation effects specialists and newcomers to the field.

INDUSTRIAL EXHIBIT

An Industrial Exhibit will be included as an integral part of the conference and will be chaired by Nadia Rezzak, Microchip. Exhibitors will include companies or agencies involved in manufacturing electronic devices or systems for applications in space or nuclear environments, modeling and analysis of radiation effects at the device and system level, and radiation testing. Exhibit and Supporter Registration will open in October.

CONFERENCE COMMITTEE

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CONFERENCE REPORTS

ICOPS 2023

50th Anniversary IEEE International Conference on Plasma Science

The 50th Anniversary ICOPS, the first fully in-person-only ICOPS since 2019 (PPPS-2019, combined Pulsed Power and ICOPS Conferences), took place in beautiful Santa Fe, NM May 21st – 25th, 2023 at the Eldorado Hotel with additional sessions at the Hilton (across the street), and a Women in Engineering (WIE) reception and presentation on the Terraza at the La Fonda Hotel. (Here is a [NM PBS documentary](#) that aired May 2023 celebrating the 100th anniversary of the La Fonda Hotel.

The General Chair of ICOPS 2023 was Distinguished Professor Edl Schamiloglu and the Technical Program Chair was Research Professor Sal Portillo, both from the University of New Mexico (UNM). Dr. Sarita Prasad (IMS-Pro LLC) was the Finance Chair and Mr. Charles Reuben of the University of New Mexico was the Conference Secretary. The organizing committee comprised 13 members.

There were over 500 abstracts submitted, about 350 from the USA, about 50 from China, 25 from the UK, 22 from India, 20 from Korea, 15 from Germany, and single-digit submissions from 22 other countries.

There were over 550 registrants at ICOPS 2023, of whom 446 were from the USA, 20 from the UK, 17 from the Republic of Korea, 13 from Germany and single-digit participation from 23 other countries.


There were a total of 38 applicants for the student travel grant this year. Of those, 24 were from the USA. We offered 16 awards, although in the end only 14 were able to accept and attend the conference. Of those who made it, 10 were from the USA. The award covered two



Edl Schamiloglu
 General Chair



Organizers

 Edl Schamiloglu General Chair	 Sal Portillo Technical Chair	 Sarita Prasad Treasurer	 Evgenya Simakov Minicourse	 Lisa Boyd Event Manager	 Remington Reid Students Travel Grants	 Chuck Reuben Webmaster
 Simon Bland Student Awards	 Will White International Visa	 Monica Blank WIE	 Matt Lara Exhibits	 Viktoria Babicheva YP	 Mike Mazarakis 50 th Anniversary Panel	



CONFERENCE REPORTS Cont. from PAGE 5

nights in a hotel and conference registration.

The conference registration opened on Sunday afternoon May 21st, followed by the 50th Anniversary reception in the evening. We thank Avalanche Energy and the Directed Energy Center at UNM (DEC@UNM) for sponsoring this reception!

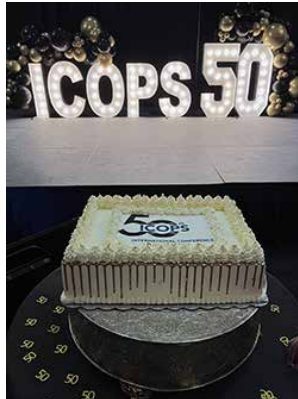
The conference technical program opened on Monday morning with the lead plenary presented by Dr. Dan Sinars of Sandia National Laboratories. The title of his plenary was "Z-pinches from 0.1 to 60 MA: Can We Keep up the (Magnetic) Pressure?" The other plenary presentations were:

- » Dr. Debbie Callahan of Focused Energy: "From Ignition on NIF to Fusion Energy on the Grid using Proton Fast-Ignition"
- » Prof. EunMi Choi, Ulsan Institute of Science and Technology in South Korea: "High Power Terahertz Sources: New Applications and Challenges"
- » Prof. Jeremy Chittenden of Imperial College in the UK: "Magnetized High Energy Density Science"
- » Prof. Yakov Krasik (PSAC Award Address) of Technion, Haifa, Israel: "What Kept me in Pulsed Power and Plasma Sciences for So Long"

There were six parallel oral sessions in the mornings and the afternoon Monday-Thursday with poster sessions after lunch Monday-Wednesday.

I would like to thank Sal Portillo, the Technical Area Coordinators (TACs), Session Organizers, and Session Chairs for their hard work!

On Monday at 11:30 AM there was the Student Paper Award Competition (SPAC) luncheon organized by Prof. Simon Bland (Imperial College, UK) and sponsored by First Light Fusion in the UK. For the first time in the history of ICOPS, SPAC was viewed by more than 100 conference attendees and Dr. Bland certainly wishes to continue this tradition. There were eight finalists who gave presentations and the judges selected the winners. Judging at this competition were Dr. Monica Blank (CPI), Prof. Yakov Krasik (Technion, Israel), Prof. Rajdeep Singh Rawat (Nanyang Technological University, Singapore), Dr. Mila Fitzgerald (First Light Fusion, UK), and Dr. Katerina Falk (Helmholtz-Zentrum Dresden-Rossendorf, Germany). The runners up were: Chen Cui (University of Southern California, USA), Rishabh Datta (Massachusetts Institute of Technology, USA), Thomas Foster (Princeton University), Shadhin Hussain (University of Texas at Dallas), Ziyao Jie (Tsinghua University, China – unable to attend), and P. S. Naga Sai Srikar (IIT Tirupati, India – unable to attend). The



Clockwise from top left:

50th Anniversary cake

Edl Schamiloglu opening the conference

WIE reception: (from left) Amber Anderson, Edl Schamiloglu, Monica Blank, Guest [name unknown]

50th anniversary panel: Edl Schamiloglu at lectern; (seated from left) Mike Mazarakis (Sandia National Labs), Jim Benford (Microwave Sciences, Inc.), Mary Ann Sweeney (Sandia National Labs), Steve Gold (Naval Research Lab, retired), Manfred Thumm, Karlsruhe Institute of Technology (retired), Steve Gitomer (Editor-in-Chief, IEEE Transactions on Plasma Science)



2023 ICOPS NPSS Outstanding Student Paper Award Recipients were: Judith van Huijstee (Eindhoven University of Technology, Netherlands) and Jergus Strucka (Imperial College London, UK). Congratulations to all the students!

On Monday evening there was the Women in Engineering Speaker Reception organized by Dr. Monica Blank (CPI) and held on the Terraza at the La Fonda Hotel. The speaker was Dr. Amber Anderson of the Air Force Research Laboratory (AFRL) who was also

the Program Manager for the AFRL Tactical High Power Operational Responder (THOR) demonstration.

On Tuesday evening there was the Young Professionals Reception and Panel organized by Prof. Viktoria Babicheva (UNM). The panelists were Dr. Muhammed Zuboraj (Los Alamos National Laboratory-LANL), Dr. Matt Domonkos (Verus Research), Prof. Jacob Stephens (Texas Tech University), Prof. Katharina Stapelmann (NC State University), Dr. Chelsea Liekhus-Schmaltz (Zap Energy), and Dr. Nichelle Bennett (Sandia National Laboratories).

On Wednesday morning there was the 50th Anniversary Panel organized by Dr. Mike Mazarakis (Sandia National Laboratories). The panel was moderated by Dr. Steven Gold (retired from NRL) and the panelists were Dr. Mary Ann Sweeney (Sandia National Laboratories), Dr. Jim Benford (Microwave Sciences), Prof. Manfred Thumm (retired from Karlsruhe Institute of Technology), and Dr. Steve Gitomer (Editor, *IEEE Transactions on Plasma Science*). Each panelist gave a brief presentation on their involvement with ICOPS over the years. This was followed by questions from the audience.

The Awards Banquet was held Wednesday evening at the Eldorado Hotel. Prior to the reception, past ICOPS Chairs present gathered for a group photo on stage (see photo to right). (I would like to thank Joe Schumer of NRL for his efforts in contacting all living past ICOPS Chairs!) Chairs of 17 ICOPS conferences were present at ICOPS 2023, although not all of these were available for the photo. There were over 200 attendees at the Awards Banquet. The PSAC Awards Chair (Prof. Ricky Ang, Singapore University of Technology and Design) then handed out the awards. Recognized at the Awards Banquet were the Outstanding Student Paper Award runners up and recipients (described earlier). Also recognized were Dist. Prof. Edl Schamiloglu (UNM) for being ICOPS 2023 Chair, Prof. Kentaro Hara (Stanford University) for receiving the 2023 IEEE NPSS Early Achievement Award, Mr. Dion J. Li (University of Michigan) for receiving the 2023 Igor Alexeff Outstanding Student in Plasma Science Award, Prof. Yakov Krasik (Technion, Haifa, Israel) for receiving the 2023 Plasma Science and Applications (PSAC) Award, and Mr. Daniel Maler (Technion, Haifa, Israel) for receiving the NPSS Robert J Barker Graduate Student Award for Excellence in Pulsed Power Applications. Congratulations to the award recipients!

The Minicourse, *Industrial Applications of Plasmas*, which took place Saturday and Sunday before the conference, was organized by Dr. Evgenya Simakov (LANL). The presenters were Prof. Katharina Stapelmann (NC State University), Prof. Sergey Baryshev (Michigan State University), Mr. George Osenga (Thiery Plasma Corporation), Dr. Artem Smirnov (TAE Technologies), Dr. Nathan Cook (Radiasoft), Dr. Max Light (LANL), and Prof. John Foster (University of Michigan). About 30 students were registered for the Minicourse.

There will be a Special Issue of the *IEEE Transactions on Plasma Science* dedicated to Plenary and Invited Talks, as well as Minicourse presentations. The Guest Editors are Prof. Jacob Stephens (Texas Tech University) and Prof. Peng Zhang (Michigan State University).

The organizers would like to thank all the sponsors and exhibitors for supporting ICOPS 2023. You can find them on the ICOPS 2023 website. The organizers



The 50-Year History of ICOPS

Year	Location	Chair	Comment	Year	Location	Chair	Comment	
1	1974	Knoxville, TN	I. Alexeff		26	1999	Monterey, CA	C. Deeney
2	1975	Ann Arbor, MI	R.R. Johnson		27	2000	New Orleans, LA	M. Mazzola
3	1976	Austin, TX	E.J. Powers		28	2001	Las Vegas, NV	T. Hussey
4	1977	Troy, NY	R.L. Hickok		29	2002	Banff, Canada	R. Fedosejevs
5	1978	Monterey, CA	R. Schwirzke		30	2003	Jeju, Korea	K.-S. Chung
6	1979	Montreal, Canada	C. Richard	Canada	31	2004	Baltimore, MD	R.J. Commisso
7	1980	Madison, WI	J.L. Shohet		32	2005	Monterey, CA	R.C. Cauble
8	1981	Santa Fe, NM	S.J. Gitomer	Canada	33	2006	Traverse City, MI	J. Asmussen
9	1982	Ottawa, Canada	A.J. Alcock		34	2007	Albuquerque, NM	E. Schamiloglu
10	1983	San Diego, CA	J.L. Luxon	Canada	35	2008	Karlsruhe, Germany	M. Thumm
11	1984	St. Louis, MO	T.J. Menne		36	2009	San Diego, CA	F. Beg
12	1985	Pittsburgh, PA	M.D. Nahemow		37	2010	Norfolk, VA	M. Laroussi
13	1986	Saskatoon, Canada	A. Hirose	Canada	38	2011	Chicago, IL	A. Hassanein
14	1987	Arlington, VA	F.C. Young		39	2012	Edinburgh, Scotland	M. Kong
15	1988	Seattle, WA	L.C. Steinhauer		40	2013	San Francisco, CA	B. Oliver
16	1989	Buffalo, NY	D.M. Benenson		41	2014	Washington, DC	J. Schumer
17	1990	Oakland, CA	J.N. Benford		42	2015	Antalya, Turkey	L. Okusz
18	1991	Williamsburg, VA	K.H. Schoenbach		43	2016	Banff, Canada	Y. Tsui
19	1992	Tampa, FL	N.L. Oleson		44	2017	Atlantic City, NJ	J. Lopez
20	1993	Vancouver, Canada	A. Ng	Canada	45	2018	Denver, CO	T. Munsat
21	1994	Santa Fe, NM	A.L. Peratt		46	2019	Orlando, FL	R. Allen
22	1995	Madison, WI	J.E. Scharrer		47	2020	Singapore (virtual)	R. Rawat
23	1996	Boston, MA	C. Chan		48	2021	Tahoe, NV (virtual)	A. Safronova
24	1997	San Diego, CA	J. Hyman		49	2022	Seattle, WA (hybrid)	S. Harilal
25	1998	Raleigh, NC	J. Gilligan		50	2023	Santa Fe, NM	E. Schamiloglu

Handwritten signatures and dates around the table:
 - Top left: John 2022, Steve 1981
 - Top right: Jim Benford 1990, Peter Commisso 2004
 - Middle left: Maler 2019, Dion J. Li 2015
 - Bottom left: Edl Schamiloglu 2020, Tom Hussey 2001, M.D. Nylk 2000
 - Bottom middle: E. Schamiloglu 2013, W. I. 2002 Karlsruhe
 - Bottom right: John 2014, Jim L. Supry 2017, IEEE logo

would like to extend their hearty gratitude and appreciation to the Event Program Manager Lisa Boyd from IEEE MCE for overseeing the success of ICOPS 2023. The organizers would also like to thank the UNM student volunteers who assisted with the conference!

The organizers of ICOPS 2023, the 50th Anniversary ICOPS, wish to thank the ICOPS community for their participation in this celebration and look forward to seeing their friends and colleagues at future ICOPS Conferences!

Finally, a slideshow with photos from ICOPS 2023 can be found on the [ICOPS 2023 website](#).

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CONFERENCE REPORTS Cont. from PAGE 7

ANIMMA-2023

An IEEE NPSS Technically Cosponsored Conference¹

We are all well aware of the fact that, over the past few decades, we have made tremendous progress in the development of measuring devices, data processing and analysis tools in many areas of interest such as computing (data mining, Artificial Intelligence, Algorithmic, Machine Learning and Deep Learning), robotics, space, health technologies, energy, environment, and transport. These advances unavoidably affect the requested performances of predictive modeling tools as well as experimental capabilities linked to our fields of activities. In this respect, the ANIMMA scientific community has both the legitimacy and the leadership to face these challenges, and continuously develop a relevant international network.

As such, each ANIMMA conference and the associated network is a seedbed of new scientific international collaborations dealing with experimental sciences and technologies.

The ANIMMA Conference has always strived to create a special meeting place shared by all those working in nuclear instrumentation and measurement and their applications, as we strongly believe that cross-border exchanges among scientists, engineers and industrialists can only lead to the most developed ideas, the best solutions and the most efficient collaborations and partnerships. Therefore, ANIMMA continues to maintain a high level of scientific and technical quality by presenting not only the latest advances but also the state of the art in each field through the participation of international specialists and experts.

ANIMMA-2023 was held exclusively in-person from June 12th – 16th at Real Collegio in Lucca, Italy. The conference was locally organized by both CAEN-Sys and University of Pisa in strong partnership with CEA (France), SCK.CEN (Belgium), Aix-Marseille-University (France), IEAP Institute (Czech Republic) and Josef Stefan Institute (Slovenia).

ANIMMA-2023 is the eighth edition of a series of conferences with a scientific program dealing with:

- » Three days dedicated to the new ANIMMA International Summer School (AISS) from June 10th – 12th
- » A full day dedicated to four international workshops on Monday June 12th



Abdallah Lyoussi
General Chair



Rastislav Hodak
Deputy General Chair



Lory Laera
Organizing Committee Chair



Massimo Morichi
Steering Committee Chair

- » Three keynote lectures on Tuesday, June 13th during the opening ceremony
- » Three relevant plenary talks at the start of each day on Wednesday, June 14th, Thursday, June 15th and Friday, June 16th, followed daily by parallel oral sessions
- » Intensive oral sessions to promote posters on Tuesday 13th and Wednesday 14th afternoon followed by a plenary poster session
- » Permanent poster session from Tuesday 13th to Friday 16th
- » Permanent industrial exhibition with 21 exhibitors from Tuesday 13th to Friday 16th

More than 270 scientific presentations were presented in 43 scientific sessions.



Francesco D'Errico
Steering Committee Co-Chair



Stanislav Pospisil
Scientific Committee Chair



Ludo Vermeeren
AISS Organization Chair

¹ <https://ieeemce.org/planning-basics/getting-started/obtaining-sponsorship/#!/workspaces/>

ANIMMA INTERNATIONAL SUMMER SCHOOL: AISS

Encouraged by the success of the short courses organized during previous ANIMMA conferences and with support from the IEEE NPSS Education Committee budget, a three-day Summer School was offered. It took place at the Department of Civil and Industrial Engineering of the University of Pisa (June 10th – 12th, 2023).

The program contained ex cathedra lectures on interaction of radiation with matter, general aspects of radiation detectors, medical physics instrumentation, fundamentals of electronics and semiconductor detectors, innovation aspects in radioactive waste

characterization, nuclear heating rate measurements, and tips for presenting scientific work. However, the emphasis of the program was put on practical sessions, some of them as plenary demonstration sessions (OPENMC and HOTSPOT simulation training, Flash proton therapy), others in the form of laboratory exercises in small groups (neutron detection, luminescence detection technique, gamma spectroscopy, statistics for radiological measurements and EasyPet). 32 students from various locations attended the ANIMMA Instrumentation Summer School.

At the end of the program, an optional examination was organized, allowing students to acquire an ECTS certificate.

Workshops

For this eighth edition, four topics focused on new challenges, new emerging techniques and technologies, and recent experimental and numerical results in various fields such as fission, fusion, and medical physics. These four workshops provided a real opportunity to exchange, discuss, perform skill cross-fertilizations and identify new collaborative projects. More precisely:

- » Nuclear instrumentation and measurement for major research facilities in the fields of fusion and fission,
- » Novel perspectives for crystalline materials for radiation detection
- » Nuclear Security & Emergencies in Homeland Security
- » Building bridges and synergies between reactor dosimetry, irradiation facility dosimetry and personal dosimetry techniques



(Counterclockwise from top left)

Special Events at ANIMMA-2023

ANIMMA International Summer School AISS at Pisa University

ANIMMA-2023 group photo at Real Collegio in Lucca, Italy

ANIMMA-2023 opening ceremony

CONFERENCE REPORTS Continued on PAGE 10



CONFERENCE REPORTS Cont. from PAGE 9

Special Events

Furthermore, for the first time, special events in strong partnership with IEEE/NPSS and EPS (European Physical Society) were organized:

- » Panel Discussion on “Nuclear Energy and Climate Change” on Wednesday June 14th evening
- » Women In Engineering (WIE) event on Thursday June 15th late afternoon to celebrate “Excellence”

and “Recognition” of Women and Minorities in the scientific fields.

ANIMMA-2023 welcomed 403 attendees from 31 countries including 80 graduate students. We awarded two best student papers and three best posters.

The ANIMMA-2023 attendees deserve our warmest thanks and consideration for making this eighth edition a great success in an extraordinary location.

All the committee members are looking forward to welcoming everyone again at ANIMMA2025 in Valencia, Spain

Prof. Dr. Abdallah Lyoussi, ANIMMA General Chairman and Program Committee Chair can be reached by E-mail at abdallah.lyoussi@cea.fr

President's Report

This newsletter write-up will summarize some of the news from the IEEE Technical Activities Board (TAB) meeting series directly relevant to our society, and describe some of the discussions from our June AdCom meeting, which was held virtually on June 23rd/24th. I will emphasize areas where member involvement at higher levels is desired, reflecting potential for synergistic interaction: benefit to the growth of IEEE TAB activities and opportunities for individuals from our community to pursue a broad range of interests, including scientific, leadership, humanitarian and educational possibilities.

Following the initial brainstorming session on Strategic Directions among TAB leadership and Society/Council (S/C) presidents in February, the following were identified as the four most important areas:

1. Improve industry engagement via conference activities beyond traditional contributed presentation/publication;
2. Improve IEEE TAB operational efficiency via organizational change;
3. Increase STEM engagement;
4. Improve engagement with underrepresented communities.

While 3 and 4 can be addressed through existing leaders/bodies ([Jamie Moesch](#) is the contact for those interested in 3, and the TAB level Diversity and Inclusion committee is already working on priority 4 ([Jane Lehr](#) and [Mitra Safavi-Naeini](#) are our D&I liaisons); new TAB-level committees are being formed to address 1 and 2 and need volunteers to participate in these efforts and provide input.

Consistent with the spirit of increasing resources/collaborations between S/C, the Presidents' Forum

was focused on activities/resources that can be shared between and derive input from several S/C. Examples include the report by the IEEE WIE chair (our liaisons are [Cinzia DaVia](#) and [Audrey Corbeil Therrien](#)) on current activities, together with a presentation of several possible action items aimed at enhancing the global impact and dissemination of WIE activities. These include Creation of a Society/Council Corner in the WIE Newsletter and WIE Magazine to promote events or women in their entity; Creation of a podcast program that would highlight women from Societies/Councils; Summarize all funds, scholarships, travel grant, award opportunities from societies in one place for WIE members' information; Mentoring for IEEE Fellow drives among WIE members; Soliciting experts on climate change from Societies/Councils and others.

Paul Cunningham, the chair of the TAB FinCom Ad Hoc on Society/Council Initiatives suggested relevant modifications to the initiatives application process: a new application form will be adopted by the societies which will require the submitter to provide more detailed information and encourage a higher level of strategic thinking while planning initiatives. Applicants will be encouraged to reach across societies, if of benefit to any particular initiative and, likewise, the initiative approval committee will look for potential synergies across S/C. Interestingly, this process parallels to some extent our own new approach to initiative submission described in my June write-up.

Another interesting program for which input from S/C is solicited is the Industry Days Concept. The objective of this program is to rebuild the value of the IEEE community to industry based on the company needs, not 'IEEE thinking.' In this scenario the industry suggests topics of interest and IEEE finds expertise among its S/C that can best provide technical advice on the specific



Vesna Sossi
IEEE NPSS President

topics and organizes meetings termed Industry Days. Importantly, seed funding for such an effort exists. We, as a society, may want to participate in such by possibly compiling a list of our expertise and associated relevant industries.

Climate change remains a very strong strategic priority for the entire IEEE; there are efforts to unify activities among the Educational Activities Board (EAB), Member and Geographic Activities (MGA), Publication Services and Products Board (PSPB), Standards and IEEE USA — to promote an efficient and coherent approach to exploiting technical expertise to identify solutions addressing sustainability challenges. If aware of any such activity in your immediate area, please contact [Cinzia DaVia](#), our IEEE Climate Change liaison, who is compiling an inventory of our recent and planned activities that can be related to sustainability.

The Chair of the TAB Future Directions Committee, C. Miyachi, reported on a recent senior IEEE representation US congressional visit, where, among other topics, they urged investment into Nuclear and Fusion Technology, which would be of direct relevance, interest and benefit to our members in the Fusion Technology area.

The TAB Technical Community Outreach, Engagement, and Society membership committee is holding S/C-

wide forums to gather ideas on increasing the value of membership to diverse audiences including students and industry. This effort is to result in the production of a User Guide of Best Practices. It is seeking input from any S/Cs that have successful membership initiatives. This also seems to parallel the 'best practices' effort that we started within our own society (see June Newsletter and below).

A very important development is the change to the IEEE Fellow Evaluation Process. Please find details in the relevant write-up by Alberto del Guerra in this issue of the Newsletter. I would also like to bring to everyone's attention the fact that we have a Fellow Search Committee headed by Alberto which can help with the application process. It is composed of experienced evaluators; thus, their advice can be very helpful.

Switching now to our own AdCom meeting and the updates I promised in the June Newsletter.

OUR OWN 'BEST PRACTICES'

Sara Pozzi, our Vice President, presented a thorough summary of our February breakout session on 'best practices' across technical areas. The following action items emerged as priorities:

Collaboration between technical areas:

1. Submission of joint initiatives whenever appropriate;
2. Common use of Basecamp and inclusion of all TC chairs on Basecamp emails.
3. Participation of TC chairs in each other's ExCom meetings.

Member engagement:

1. Each IEEE-sponsored conference General Chair (GC) is to show slides describing IEEE and NPSS in the introductory talk. A set of slides will be made available and each GC can use any subset in a personalized presentation.
2. Promotion of tangible benefits of being a member and senior member;
3. Increase of first year members and young professional (YP) engagement;
4. Development and dissemination of videos to promote NPSS at conferences and on social media and websites.

NEWSLETTER

Significant progress has been made on the format of the new newsletter, which is to become entirely online and interactive starting in 2024. Stay tuned! We also now have a new brochure describing NPSS, which will be available at membership desks at any of our conferences.

ADCOM RANKING OF SUBMITTED INITIATIVES

AdCom ranked the 15 newly submitted initiatives — the ranked list has been submitted to IEEE TAB FinCom for approval. We are expecting to be able to fund most of them as our society continues to be financially sound.

Several other reports on the status of Publications, Awards, Educational and D&I activities and from the Communication Committee were presented and they were all overwhelmingly positive.

This AdCom meeting was relatively short, as it was held online. Nevertheless, there was a lot of energy and progress was described by each presenter — many thanks to all the committee members for their dedication and work. As you can see from this short write-up and other articles in the Newsletter, there are many opportunities for involvement at several organizational levels; we are always looking for enthusiastic and capable volunteers. While these activities do require effort, they are also very rewarding and they offer the opportunity to interact with remarkable people working in fascinating areas. If anyone reading this Newsletter is interested in volunteering for any activity, please come forward! You'll be greeted with enthusiasm, and we'll be pleased to answer any questions you may have.

Vesna Sossi

Vesna Sossi
IEEE NPSS President

Vesna Sossi, IEEE NPSS President, can be reached by E-mail at vesna@phas.ubc.ca

Secretary's Report

As Vesna noted above, AdCom met virtually with FinCom and ComCom meetings being held on June 23rd and AdCom meeting with a limited agenda on June 24th. We were pleased to have guests Lisa Boyd from IEEE MCE and Mark Tillack, retired, UCSD, join us.

Our treasurer, Ralf Engels, confirmed that at the moment the society is fiscally sound. However, there are a number of threats to that situation including reduced revenue from hybrid conferences which are less predictable and therefore harder to forecast expenses and income than conventional in-person conferences, the increasing risk of significantly reduced publication income from Open Access (OA), exacerbated by a directive that all US government-funded research papers must be available in OA without a grace period, and also potential changes in how IEEE taxes society income which will reduce our

funds further. This will, therefore, limit our initiatives activities as well, possibly, as such things as creating new awards or other activities of benefit to our members

Ralf reiterated that all conference treasurers must use the budget tool and if a loan is needed it may take two to three months to process the request which cannot, itself, be initiated until the budget has been approved. Most importantly, the budget entries need to be kept up to date. He also asked whether we want to continue with print media for our journals. Many prefer reading paper but is the expense warranted when all our members have access to these journals on line?

Paul Dressendorfer, Publications Chair reported on discussions with IEEE related to our journal pricing and thus far no satisfactory answers have been obtained.



Albe Larsen
IEEE NPSS Secretary and Newsletter Editor

Paul also noted that if we ceased providing print editions of our journals the revenue overall would drop. In addition, IEEE is changing its accounting plan. This will also cost NPSS revenue. There also seem to be discrepancies/inaccuracies in the base being used.

SOCIETY GENERAL BUSINESS Cont. from PAGE 11

He also commented on the five-year reviews of our journals. There were no major concerns but the concerns noted included the limited geographical diversity of all editors and the very limited number of women editors. And as noted in prior reviews, the Editors-in-Chief have served too long in some instances. The TPS editor, who has served about 30 years, will retire in 2024.

Reports were also received from the Finance Committee principally related to Initiatives, and from the Communications Committee with discussion of the new brochure and of the need for each conference to have a link on its web site to Join IEEE and NPSS. The Fellow Evaluation Chair provided a report outlining some of the new procedures for the committee, the Nominations Committee chair noted AdCom positions to be filled and urged TC committees to get their nomination slates submitted quickly. The Awards chair noted that the

awards presented by Technical Committees all have to have their descriptions brought into alignment with current policy. EduCom noted that two schools were already held this year and others are already being planned for 2024. Guidelines: Get TC chair to approve request; have a budget; enlist local support, including financial.

Between meetings AdCom voted, as reported in the last Newsletter, to reduce the number of mandatory elected seats on a TC ExCom or Standing Committee from 15 to nine.

ADCOM ACTIONS

- » CANPS moves that AdCom approve the new wording for the CANPS award as presented to AdCom on June 24, 2023 Approved, 21 Y 0 N, 0 A.
- » RE moves to create a new service award:
- » Recognition of a member of the Radiation Effects

community who has demonstrated exemplary services to the meetings and conferences of the Radiation Effects Committee over a sustained period.

- » Funded by the Nuclear and Space Radiation Effects Conference unless a suitable endowment is established.

Approved by AdCom 22 Y, 0 N, 0 A

- » FinCom approves transferring up to \$500k from 2023 surpluses to the NPSS Foundation Fund in November. The exact amount will be determined by the NPSS Treasurer and the NPSS President. Approved: 21 Y, 1 N, 0 A.
- » FinCom approves using the prioritization of initiatives submitted for approval on 6/23/23. Approved 21 Y, 0 N, 0 A.

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

Pulsed Power Science and Technology

We had a great turnout for the 2023 Pulsed Power Conference in San Antonio, TX, in June. I would like to send special thanks to everyone who served on the conference organizing committee, contributed to the Workshop on Pulsed Power for Fusion Applications, chaired a session, presented their research, or just showed up to have a good time in San Antonio.

I would like to congratulate all of our conference award winners for their outstanding research in the field of pulsed power. The Erwin Marx Pulsed Power Award was presented to Dr. Rick B. Spielman for contributions to the development of vacuum post-hole convolutes and magnetically insulated transmission lines (MITL) and their successful impact on Sandia National Laboratory's Z-Machine and Saturn pulsed power machines.

The Peter Haas Pulsed Power Award was presented to Dr. Bryan V. Oliver for contributions to the

development of pulsed power capabilities for X-ray radiography and the science of radiation effects in materials and electronics.

The 2022 Arthur H. Guenther Pulsed Power Student Award was presented to William Brooks for his contributions toward the understanding of high current lightning propagation in wire-carrying electrical conduits. The 2023 Arthur H. Guenther Pulsed Power Student Award was presented to Hao Sun for his contributions towards advancing the understanding of inductive pulsed power supplies for sourcing electromagnetic launchers. The winner of the Pulsed Power Conference's Best Student Paper was Timothy Wong from the University of Strathclyde, and the honorable mention went to Ejlal Shahriari from the Universite de Pau. We look forward to seeing everyone again in 2025 in Berlin at the combined Pulsed Power and Plasma Science Conference, PPPS.



Heather O'Brien
PPST Chair

Heather O'Brien, PPST Chair, can be reached by E-mail at heather.k.obrien.civ@army.mil

Particle Accelerator Science and Technology

The [International Particle Accelerator Conference](#) IPAC'23 was held in Venice, Italy this year, organized by our European colleagues from the EPS, also sponsored by IUPAP, and hosted by the INFN Institutes in Legnaro and Trieste. IPAC is the largest event in the accelerator field and this year's conference, the first after the pandemic, drew a record attendance.

Next year's event IPAC'24 in Nashville, Tennessee, May 18th – 24th, 2024, is co-sponsored by IEEE NPSS and APS DPB and preparations are now well under way. Conference Chair Fulvia Pilat (ORNL), Scientific Program Chair Wolfram Fischer (BNL), Local

Organizing Committee Chair Robert Saethre (ORNL) and the entire organizing team are determined to make IPAC'24 equally successful. The Local Organizing Committee has developed an optimal layout of the poster and industrial sessions, and many companies have started signing up for booths. The Scientific Program Committee has met twice already and has selected the invited talks. We are looking forward to IPAC'24 in Nashville. For details please visit the [conference website](#).

Wolfram Fischer, PAST Chair, can be reached by E-mail at wfischer@bnl.gov



Wolfram Fischer
PAST Chair

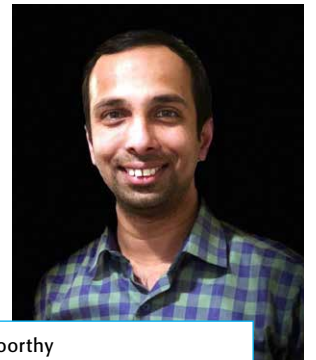
Radiation Instrumentation

We just successfully concluded the first of our RISC-related technically cosponsored conferences, ANIMMA 2023. Please see this newsletter for a detailed summary of the conference and a workshop that was held in conjunction with the conference. Preparations for our primary RISC conference, the 2023 NSS/MIC/RTSD in Vancouver are also in full swing. Like many, I too look forward to the scientific portion and to meeting many of you in person. Encourage everyone to take advantage of the September 14th early bird deadline to register for the conference. The conference Joint Oversight Subcommittee (JOS) has also completed evaluating proposals from several European sites for the 2026 NSS/MIC conference, and a formal announcement is expected by the Vancouver meeting.

I would also like to highlight a competitive NPSS funding mechanism ("Initiatives") available to support

and promote pilot activities that are currently not funded under our operational budget. The proposals need to be aligned with the strategic goals of NPSS, and benefit members of our technical area. The early submission deadline for the next cycle is in January 2024. However, it is always helpful to reach out early via email or in-person during the conference. If you are interested and have ideas you would love to explore, please reach out to me or to our current RISC Initiatives Chair [Lorenzo Fabris](#).

And finally, a reminder about the annual RISC Members-at-Large election where we elect five new members to serve a three-year term on the Radiation Instrumentation Steering Committee (RISC). This election is administered by IEEE and so be on the lookout for the ballot and do not forget to cast your vote before the deadline!



Srilalan Krishnamoorthy
RISC Chair

Srilalan Krishnamoorthy, RISC Chair, is with University of Pennsylvania; Phone: +1 215 746-6892; Mobile +1 631 355-9958; E-mail: srilalan@pennmedicine.upenn.edu

DOUBLE THREAT

... while everyone knows that engineering is concerned with the conversion of science into technology, everyone does not know that engineering also does just the opposite and translates technology into new science and mathematics.

Vannevar Bush

AND THAT'S NO JOKE

It's a joke to say that engineering is applied science when engineers are past masters at taking knowledge where science cannot penetrate.

Barry Allen

IN CONTRAST WITH SCIENTISTS

Engineers do not need to imagine the unimaginable, they have to imagine the manageable.

Henry Petroski

WIKIPEDIA!

Science is built with facts as a house is with stones, but a collection of facts is no more a science than a heap of stones is a house.

Jules Henri Poincaré

BUT YOU HAVE TO ACTIVELY SEEK

It is a profound and necessary truth that the deep things in science are not found because they are useful; they are found because it was possible to find them.

J. Robert Oppenheimer

THEN, THERE ARE THE POPULAR, NON-FALSIFIABLE THEORIES, ALAS...

I cannot stress often enough that what science is about is not proving things to be true but proving them to be false.

Lawrence M Krauss

LABOUR EXCLUDED

Mathematics is the part of physics where experiments are cheap.

Vladimir Arnold

Awards

Society Awards

NPSS congratulates its 2023 Society Award Recipients whose photos and brief bios appear below.

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

SHEA AWARD

STEFAN RITT

Paul Scherrer Institute

Stefan Ritt obtained his Ph.D. in physics from the University of Karlsruhe, Germany, in 1993. Currently, he is the head of the Muon Physics Group at the Paul Scherrer Institute in Switzerland. His group focuses on conducting highly sensitive experiments using high-intensity muon beams at the lab's proton accelerator, aiming to explore the realms of New Physics beyond the Standard Model of Particle Physics. These cutting-edge experiments necessitate the utilization of state-of-the-art technology in data acquisition hardware and software, often requiring in-house development due to their unavailability in the commercial market.

Stefan has gained recognition as a key contributor to the development of several prominent tools and technologies. He is widely acknowledged as the primary developer of the MIDAS data acquisition package, a collaborative effort with TRIUMF, Canada (midas.triumf.ca), as well as his electronic logbook eLog (elog.psi.ch/elog). Furthermore, his contributions extend to the creation of the DRS4 chip (www.psi.ch/drs) which allows time measurements at the Picosecond level, for which he was honored with the prestigious NPSS Emilio Gatti Radiation Instrumentation Technical Achievement Award in 2020.

In addition to his remarkable technical accomplishments, Stefan actively engages with the NPSS community. Since 2003, he has played an integral role in the organization of the IEEE NPSS Real Time Conference, assuming the position of General Chair for the first-ever virtual Real Time Conference in 2020, amidst the challenges posed by the COVID pandemic. He has also served as a regular topic convener in the NSS/MIC conference since 2013 and held the position of NSS co-chair in 2020, with plans to reprise this role in 2024. Looking ahead, Stefan is slated to serve as the General Chair of the NSS/MIC conference scheduled to take place in Europe in 2026.

Within the NPSS Administrative Committee, Stefan has held various significant positions. He has served as the

Technical Committee Chair for CANPS, Nominations Chair, Awards Chair, and held the esteemed role of NPSS President from 2017 to 2018. Additionally, he spearheaded the establishment of the NPSS Educational Committee, which oversees the NPSS schools, and has served as its inaugural chair since 2022. Stefan's remarkable contributions have been recognized with his induction as an IEEE Fellow in 2016.

Citation: For his innovative leadership as the President of the NPSS and an organizer and instructor at NPSS Summer Schools and as a world-leading expert in the field of ultra-fast data acquisition.

EARLY ACHIEVEMENT AWARD

KEN HARA

Stanford

Ken Hara is an Assistant Professor of Aeronautics and Astronautics at Stanford University. He received a Ph.D. in Aerospace Engineering and a Graduate Certificate in Plasma Science and Engineering from the University of Michigan (2015), and B.S. and M.S. in Aeronautics and Astronautics from the University of Tokyo (2008, 2010). Prior to his appointment at Stanford, he was a Visiting Research Physicist at Princeton Plasma Physics Laboratory as a Japan Society for the Promotion of Science Postdoctoral Fellow (2015-2016) and an Assistant Professor of Aerospace Engineering at Texas A&M University (2016-2019). His research interests include spacecraft electric propulsion, low temperature plasmas, plasma instabilities and wave-plasma interactions, plasma sheaths, pulsed plasmas, atmospheric pressure arc discharge, computational plasma dynamics, data-driven modeling, and rarefied gas flows. He has investigated various fluid and kinetic phenomena in low-temperature partially magnetized plasmas, including breathing mode oscillations,



Ron Schrimpf
Awards Chair

azimuthally rotating spokes and gradient-drift instability, enhanced cross-field transport due to coupling of kinetic instabilities such as electron cyclotron drift instability and ion-ion two-stream instability, and current-carrying ion-acoustic instability. In addition, he has contributed to developing computational capabilities, including full fluid moment models, particle-based kinetic simulations such as particle-in-cell and Monte Carlo collision methods, grid-based direct kinetic models, and state estimation techniques using Kalman filters.

Citation: For contributions to development of computational models and understanding of low-temperature partially magnetized plasmas

GRADUATE SCHOLARSHIP

LOUIS-DANIEL GAULIN

Université de Sherbrooke

Louis-Daniel Gaulin completed his undergraduate studies in electrical engineering at the University of Sherbrooke and did COOP internships in electronic circuit design dedicated to positron emission tomography. He is now pursuing his master's degree in applied sciences at the same institution where he is a pioneer in electronics dedicated to time-of-flight computed tomography. The objective of this electronics is to acquire the first Time of Flight (ToF) CT image in

2023 Society Award Winners



Stefan Ritt
Shea Award



Ken Hara
Early Achievement Award



Louis-Daniel Gaulin
Graduate Scholarship Award

2023 Society Award Winners



Nathan Giha
Graduate Scholarship Award



Ricardo Lopez
Graduate Scholarship Award



Alex Meadows
Graduate Scholarship Award



Hao Sun
Barker Graduate Award

order to demonstrate the feasibility of this technology with existing circuits on the market. More specifically, he designs very high speed, low noise printed circuit boards and electronic systems. In addition to his research, he is also a dedicated mentor for a robotics team, while helping his fellow students through volunteer academic support. Louis-Daniel has received numerous awards for his academic excellence, such as the Leonardo da Vinci award from the Faculty of Engineering at the University of Sherbrooke, as well as for his leadership and community involvement.

NATHAN GIHA**University of Michigan**

Nathan Giha joined the Detection for Nuclear Nonproliferation Group as an undergraduate at the University of Michigan, where he developed silicon photomultiplier readout electronics for compact neutron imaging systems. In Fall of 2019, he continued with the group as a Ph.D. student. His graduate research focuses on quantifying the relationship between the energy and angular momentum of fission fragments through correlated measurements of fragment properties and the prompt neutrons and gamma rays they emit.

RICARDO LOPEZ**University of Michigan**

Ricardo Lopez graduated from the University of Michigan in 2020 with a B.S.E. in Nuclear Engineering and Radiological Sciences and then joined the Detection for Nuclear Nonproliferation research group while pursuing his master's degree. After earning his M.S.E. in Nuclear Engineering in 2021, he continued with DNNNG as a Ph.D. student where he works with a compact dual-particle imaging system for use in nuclear safeguards and nonproliferation applications. Ricardo has been able to publish work on an organic glass scintillator imager and has had his research recognized in various international conferences. Current and future work involves further improving the imaging system

and developing an alternative method for imager data visualization using an augmented reality approach.

ALEX MEADOWS**Colorado State University**

Alexander Meadows is a senior graduate student completing his Ph.D. in electrical engineering and performing research on laser-plasma interactions and advanced laser development at Colorado State University. He began in this field in 2012 while pursuing a master's degree at the University of Texas at Austin, where he joined the Texas Petawatt laser laboratory. This large laser facility served as the site of the experimental work for his master's degree, which was based on research performed by irradiating ultrathin targets at extremely high intensities with an ultrashort laser pulse. In the following years, Alex also performed laser-plasma research at the Extreme Light Infrastructure project in Europe and worked in various precision optical production facilities on cutting-edge scientific products. Alex came to Colorado State University in 2017 and has worked on high average power and high peak power lasers for the production of extreme plasma states of matter. His doctoral work is based on the development of a few-cycle laser beamline for the irradiation of nanostructured solid targets at relativistic intensities of 1020 W/cm^2 with pulses of 3-5 fs duration. This will create a dramatically different plasma environment than that in typical solid target laser experiments, with applications including the production of high-brightness X-ray sources, energetic collimated sources of ion and electron beams, and quasi-monoenergetic pulses of neutrons.

BARKER GRADUATE AWARD**HAO SUN****Tsinghua University**

Hao Sun received the Bachelor's degree in electrical engineering from Tsinghua University, China, in 2018,

where he is currently pursuing the Ph.D. degree in electrical engineering with the Department of Electrical Engineering.

Since 2017, he has conducted research under the guidance of Prof. Xinjie Yu in the field of pulsed power supplies. The pulsed power device he designed and built has a very high energy density, paving a brand-new way forward to the miniaturization of the special power supply. In addition, he has conducted in-depth research on inductive energy control and system modeling. He successfully decoupled the complex system from topological design, magnetic field calculation, energy flow and other aspects. By applying the machine-learning method, he successfully presented a system-wide parameter optimization strategy for achieving the global optimal with an acceptable calculation capability. His work has been presented in over ten peer-reviewed journal publications.

Hao Sun once served as the chairman of the department student union, the teaching assistant for the famous online course 'Principles of Electric Circuits' of Tsinghua University, the backbone of the university online teaching assistant team during the COVID-19 pandemic, and a member of the task force for several national/international conferences.

HOFFMAN EARLY CAREER AWARD**HAN GYU KANG****National Institutes for Quantum Science and Technology**

Dr. Han Gyu Kang is a researcher at the National Institutes for Quantum Science and Technology (QST) in Japan. He obtained his B.S. (2012), M.S. (2014), and Ph.D. (2018) degrees at Eulji University in South Korea under the supervision of Prof. Seong Jong Hong. Dr. Kang focused his research on SiPM-based ToF-DOI detectors and PET/MR scanners during his B.S. and M.S.

FUNCTIONAL COMMITTEES Cont. from PAGE 15

courses. Over the course of his Ph.D. research, Dr. Kang developed a novel multimodal laparoscope, which led him to win the presidential prize from Eulji University twice (2016, 2017) and an award from the Deputy Prime Minister of Korea (2019).

In 2018, Dr. Kang joined Yamaya-Lab at QST in Japan. Recently, Dr. Kang developed a submillimeter-resolution PET (SR-PET) scanner that can achieve a resolution approaching 0.5 mm for mouse brain imaging (2023 JNM). Dr. Kang optimized the SR-PET geometry and designed the front-end electronics, including the gantry. Dr. Kang has been collaborating with LMU for SIRMIO PET, Tohoku University for whole-gamma-imaging, and Nagoya University for particle beam imaging. The Hoffman Grant will greatly promote these collaborative works.

Since 2013, Dr. Kang has contributed to the IEEE MIC (five orals, 25 posters), the GATE meeting (five orals), and the STIR meeting (one oral) as the first presenter. Dr. Kang has published 26 peer-reviewed papers (13 first authors, one corresponding author, and 12 co-authors) and a book chapter, including five patents. His current research interest is to achieve sub-0.5 mm PET resolution to unravel the brain function of disease model mice.

JASZCZAK GRADUATE AWARD

JULIEN ROSSIGNOL

Université de Sherbrooke

Julien Rossignol completed his master's thesis in electrical engineering at the Université de Sherbrooke in 2019. In this work, he pioneered and put the base on time-of-flight computed tomography, a research field in expansion today. Owing to the quality of his talks and to the novelty of the topic, Julien was awarded the Christopher J Thompson student award at the 2018

IEEE NSS/MIC. He is completing his Ph.D. at Université de Sherbrooke where he is trying to demonstrate the technical feasibility of the technique. His work generated three patents and numerous publications. His leadership has helped build the time-of-flight team from a single student to more than fifteen currently. This leadership transcends the medical imaging community as Julien has found success in numerous endeavors to better communicate science, improve student quality of life and innovate in engineering education.

KNOLL POST DOCTORAL AWARD

OSKARI PAKARI

University of Michigan

Oskari Pakari is a tenure-track scientist at the Laboratory for Reactor Physics and Systems Behavior (LRS) at the Swiss Federal Institute of Technology Lausanne (EPFL). His current research interests include nuclear security, 3D radiation measurements, nuclear reactor safety, and nuclear data.

Oskari received a B.Sc. degree in physics in 2014 from Karlsruhe Institute of Technology and a joint M.Sc. degree in Nuclear Engineering from ETH Zurich and EPFL in 2016. He then joined LRS to pursue a Ph.D. in physics at EPFL. He investigated neutron and gamma-ray noise measurements in research reactors and graduated in 2020. In 2021, he was a postdoctoral researcher at the dosimetry lab at Paul Scherrer Institute studying emergency dosimeters and the fundamental luminescence properties of common dosimetric materials. In 2022, he joined the Detection for Nuclear Nonproliferation Group at the University of Michigan as a postdoctoral research fellow. Since early 2023, he is in charge of teaching and experiments at the LRS research reactor CROCUS.

Oskari has studied a wide range of applications of

nuclear technology. For instance, he found that common face masks exhibit a luminescence response to ionizing radiation and face masks could therefore be used as dosimeters. He presented this work as a Science Slam at the EUROSAFE Forum 2021 and won the 2nd prize ETSON award. More recently, he led an effort to implement a real-time mixed-reality visualization technique to directly show radiation fields in 3D to a user wearing smart glasses.

KNOLL GRADUATE AWARD

VANESSA NADIG

RWTH Aachen University

Vanessa Nadig is currently pursuing her Ph.D. in the field of physics, more precisely medical imaging, at the Department of Physics of Molecular Imaging Systems (PMI) at RWTH Aachen University under the guidance of Prof. Dr. Volkmar Schulz and Dr. Stefan Gundacker. She obtained her Bachelor's (2016) and Master's degree (2019) in physics from RWTH Aachen University and spent one semester abroad at Université Pierre et Marie Curie and Université Paris Diderot in 2017.

Vanessa's research enthusiasm focuses on advanced fast-timing detector technologies in positron emission tomography with the goal to upscale emerging readout techniques to system level. Working on this challenging task, she envisions promoting their applicability as future standard measures in early stage detection of life-threatening diseases such as cancer and Alzheimer's. Vanessa is leading the project "ProtoTOF" funded by the Faculty of Medicine at RWTH Aachen University together with Dr. Gundacker. She and her research focus have been highlighted by the "Female Physicist of the Week" campaign of the German Physical Society in 2022.

2023 Society Award Winners



Han Gyu Kang
Hoffman Early Career Award



Julien Rossignol
Jaszak Graduate Award



Oskari Pakari
Knoll Post Doctoral Award



Vanessa Nadig
Knoll Graduate Award

Radiation Effects 2023 Phelps Award Winners

The 2023 Paul Phelps Continuing Education Grant was awarded to four student members from the radiation effects community. At the opening of the NSREC Conference (July 24th, 2023), Robert Reed, Chair of the Radiation Effects Steering Group, announced the grant awards. The grants included tuition for the 2023 NSREC Short Course and a check for \$750.

The purpose of the Phelps Grant is to promote continuing education and encourage membership in the Nuclear and Plasma Sciences Society (NPSS). The criteria for judging are exceptional promise as a student, postdoc or research associate in any of the fields of NPSS, or exceptional work in those fields by currently unemployed NPSS members with an expectation that attendance at the Short Course will improve the possibility of obtaining a job in an NPSS field.

The four recipients of the 2023 Paul Phelps Continuing Education Grant were Sarah Azimi, Tomasz Rajkowski, Jeffery Tang, and Yoni Xiong.

Sarah Azimi completed her undergraduate studies in Electrical Engineering at Isfahan University of Technology in Isfahan, Iran, in 2013. In 2015, she joined Politecnico di Torino to pursue a Ph.D. under the guidance of Prof. Luca Sterpone. She successfully obtained her Ph.D. in 2019 and currently works as a researcher in the CAD & Reliability group at the Computer and Control Engineering Department of Politecnico di Torino. Sarah's primary research focus revolves around the analysis of radiation effects and the development of mitigation techniques, with a focus on radiation-induced transient errors in integrated circuits and reconfigurable logics such as FPGAs. She participated in many radiation test campaigns to validate these techniques at facilities like CERN's heavy ion and PSI's proton facilities. Sarah has actively participated in various industrial space-oriented applications throughout her research career. Notably,

she contributed to the EUCLID space mission led by the European Space Agency, which was launched in July 2023. Sarah's research findings have been published in over 70 international conference records and journals, with notable contributions to conferences such as RADECS and NSREC and journals such as *IEEE Transactions on Nuclear Science*. These publications highlight the significant impact of her work in the field.

Tomasz Rajkowski has several years of experience in nanosatellite projects in which he was involved at the Space Research Center (Poland) from 2011-2017. In 2018 he joined the RADSAGA program, where he pursued his Ph.D. studies at the University of Montpellier (France) in collaboration with the 3D-Plus company. He investigated the possibilities for radiation qualification of the System-in-Package modules by means of system-level testing. The work was supervised by Prof. Frédéric Saigné from the University of Montpellier and Pierre-Xiao Wang from 3D-Plus. The study performed let him present various opportunities and limitations for the qualification based on the system-level radiation tests. Tomasz also proposed a method for the so-called limited radiation qualification of electronic systems and presented a proposal for a product design cycle that uses different types of tests to give limited radiation qualification. The Ph.D. study results were presented during RADECS and IEEE NSREC conferences, as well as published in the *IEEE Transactions on Nuclear Science*. Tomasz has been a postdoctoral researcher at the National Center for Nuclear Research (Poland), where he continues his research on system-level radiation testing and qualification, in collaboration with the RADNEXT project. He also works on the topic of SEE testing with electron beams and comparison to standard SEE test methods.

Dr. Jeffrey Teng grew up in many places, including Taiwan, Alabama, Florida, and most recently, Wisconsin.



Teresa Farris
Radiation Effect Vice Chair, Publicity

He obtained his B.S. in electrical engineering from the Georgia Institute of Technology in 2018, where he stayed to complete both his M.S. and Ph.D. in electrical engineering under Dr. John Cressler. His research focused on the interaction of space radiation on microelectronics with emphasis on SiGe BiCMOS technologies and RF circuits and systems. He is currently working there as a post-doc, where he will spend a year working on SiGe HBT profile engineering and lecturing undergraduates on RF engineering. During his graduate studies, he was the recipient of outstanding paper awards in both the IEEE Nuclear and Space Radiation Effects Conference (NSREC) and the European Conference on Radiation and Its Effects in Components and Systems (RADECS). In his free time, Jeff is an avid gamer, practices and performs the violin, and enjoys ethnic cuisines and unique dining experiences.

Yoni Xiong, a Ph.D. student at Vanderbilt University, is pursuing her degree in the field of radiation effects and reliability. She graduated with highest honors in Electrical Engineering from Vanderbilt University in 2021. She is a recipient of the Department of Energy (DOE) National Nuclear Security Administration (NNSA) Stewardship Science Graduate Fellowship for her graduate studies. At NSREC 2022, she received the Best Student Paper award for her work on characterizing single-event cross sections at the 5-nm and 7-nm bulk FinFET node. She currently

FUNCTIONAL COMMITTEES Continued on PAGE 18

2023 Phelps Award Winners



Sarah Azimi



Tomasz Rajkowski



Jeffrey Teng



Yoni Xiong

HAPPY AS A SLUG

Nothing contributes to peace of soul than having no opinion at all.

Georg Christoph Lichtenberg

UNCERTAINTY PRINCIPLE

Doubt is not a pleasant condition, but certainty is absurd.

Voltaire

YOU MEAN THERE'S MORE?

It's what you learn after you know it all that counts.

Harry S Truman

AS HISTORY ATTESTS

Those who know how to win are much more numerous than those who know how to make proper use of victories.

Polybius

I'M SAFE!

It's far safer to know too little than to know too much.

Samuel Butler

THANKS, PAL

Only a fool learns from his mistakes. The wise man learns from the mistakes of others.

Otto von Bismarck

TIRED AND NOT QUITE SUCCESSFUL

Nobody realizes that some people expend tremendous energy merely being normal.

Albert Camus

YOU CAN SEE THROUGH ME!

Intellect is invisible to the man who has none.

Arthur Schopenhauer

BECAUSE WHY?

You can tell whether a man is clever by his answers. You can tell whether a man is wise by his questions.

Naguib Mahfouz

CAN'T DO IT

It's so simple to be wise. Just think of something stupid to say, and then don't say it.

Sam Levinson

LIKE HOW MANY THEY ARE

I have never met a man so ignorant I couldn't learn something from him.

Galileo Galilei

FUNCTIONAL COMMITTEES Cont. from PAGE 17

serves as the chair of the Vanderbilt University Student Branch Chapter of IEEE NPSS. Ms. Xiong's research interests include characterizing advanced technologies to various radiation effects for a multitude of parameters. She has published papers dealing with single-event effects, total-ionizing dose effects, dose-rate effects, and displacement-damage effects. She has also characterized advanced technologies for aging effects. Yoni has presented her research findings at major IEEE symposia including NSREC, RADECS, and IRPS. Yoni has authored or co-authored 16 journal papers and conference proceedings papers focused on radiation effects in microelectronics. She has gained industry experience at Sandia National Laboratories, Northrop Grumman, and Cisco Systems. Currently, Yoni is actively engaged in investigating radiation effects and reliability on the 5-nm and 3-nm bulk FinFET nodes. With the rapid advancement of semiconductor technology, the shrinking dimensions of transistors pose new challenges in terms of their susceptibility to radiation-induced effects. Yoni's research focuses on understanding the impact of radiation on the performance and reliability of these cutting-edge FinFET devices. Her research involves rigorous experimentation, data analysis, and simulation techniques to comprehensively characterize and model the response of the advanced bulk FinFET nodes to different types of radiation exposures.

NOMINATIONS FOR 2024 RADIATION EFFECTS AWARDS

Nominations are due January 26th, 2024, for awards that will be presented at the IEEE NSREC 2024 Conference, July 22nd - 26th, in Ottawa, Canada.

RADIATION EFFECTS AWARD NOMINATIONS

Nominations are currently being accepted for the 2024 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 Ottawa, Canada. Forms are available electronically at <http://ieee-npss.org/technical-committees/radiation-effects/> and must be submitted by January 26th, 2024. Additional information can be obtained from Mike Tostanoski, Senior Member-at-Large, Radiation Test Solutions, for the Radiation Effects Steering Group. Mike can be reached at mtostanoski@radiationtestsolutions.com

RADIATION EFFECTS EARLY ACHIEVEMENT AWARD NOMINATIONS

Nominations are currently being accepted for the 2024 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 Ottawa, Canada. Forms are available electronically at <http://ieee-npss.org/technical-committees/radiation-effects/> and must be submitted by January 26th, 2024. Additional information can be obtained from Mike Tostanoski, Senior Member-at-Large, Radiation Test Solutions, for the Radiation Effects Steering Group. Mike can be reached at mtostanoski@radiationtestsolutions.com

PAUL PHELPS CONTINUING EDUCATION GRANT NOMINATIONS

Nominations are currently being accepted for the 2024 Paul Phelps Continuing Education Grant. The purpose of the grant is to promote continuing education (attendance at the 2024 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 2024 NSREC in Ottawa, Canada. 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 and must be submitted by January 26th, 2024. Additional information can be obtained from Megan Casey, Member-at-Large, NASA GSFC, for the Radiation Effects Steering Group. Megan can be reached at megan.c.casey@nasa.gov.

Teresa Farris, Radiation Effects Vice Chair, Publicity can be reached at teresa.farris@archon-llc.com

The NPS Fellow Search Committee and Changes to the Fellow Evaluation Process

THE NPS FELLOW SEARCH COMMITTEE

The Functional Fellow Search Committee has been established to assist in the NPSS Fellow nomination submission process to the IEEE. The Chair of the committee is a non-voting member of AdCom.

RATIONALE

The number of IEEE members elevated to Fellow every year cannot exceed 0.1% of all IEEE members. Although this rule is not directly applied to each society, the results of previous years are statistically consistent with this rule: for NPSS (about 3000 members) it means a number between 2 and 4 elevated fellows every year. Since this is a highly competitive process at the IEEE level, the nominations must be written well and follow the IEEE evaluation criteria. It is also evident from the IEEE manuals that the number of submissions must correspondingly be high, in such a way that the rate of success could oscillate between 20 and 40%. Hence the nominations must be numerous.

STRUCTURE OF THE COMMITTEE

The Fellow Search Committee (FSC) is established as a Functional Committee of NPSS with the task of increasing the number and improving the quality of the nominations to elevate IEEE NPSS members to the Fellow status.

The Committee consists of a minimum of three members, including the Chair, who have previously been members of the NPSS Fellow Evaluation Committee, preferably Chairs or Vice-Chairs of the above committee. The Chair of the FSC is appointed by the President of NPSS. The other members are nominated by the Committee Chair. The Chair of the FSC committee has the responsibility to verify that all the scientific topics of NPSS are covered at large by the Committee. If necessary, the number of the FSC members may be increased.

The position of FSC Chair lasts for two years and may be renewed for a second term. The other members of FSC can stay for a three-year term. Two additional years are allowed if the member is nominated Chair of the committee. As of today, the members of the FSC are Alberto Del Guerra (Chair), Jane Lehr, and Edl Schamiloglu.

TASK OF THE FSC

The NPSS President informs the chairs of all NPSS TCs that the correctness of the nomination to Fellow could be assessed by the FSC. In order to be proactive, this communication should be done well in advance of the submission deadline. Each nomination assessment will be done by the FSC based on the same general parameters as adopted by the IEEE Fellow Committee.

The operational tasks of the FSC are:

- » keep current on the IEEE evaluation criteria
- » remind TCs to nominate members to be elevated to Fellow
- » explain evaluation criteria to nominators and answer specific questions if necessary
- » if asked, its members read the nomination, and provide comments concerning its correctness with respect to the IEEE rules and guidelines. Each nomination assessment will be done by the FSC based on the same general parameters as adopted by the IEEE Fellow Committee.

RECENT CHANGES TO THE FELLOW EVALUATION PROCESS

The IEEE Board of Directors, at their November 2022 meeting, approved enhancements to the IEEE Fellow Process recommended by a three-year Ad Hoc committee. Some of those changes were implemented for the 2024 Fellow Class and are noted below. As we move forward to the opening of the nomination cycle for the 2025 Fellow Class, additional changes will be implemented to the Fellow Process. Both sets of changes are noted below as updates, with specific details:

CHANGES AFFECTING THE IEEE FELLOW CLASS OF 2024 (EVALUATION PROCESS AT THE SOCIETY LEVEL COMPLETED)

Nomination form changes:

- » Added "Gender" item
- » Removed "Disambiguation Identifier" (ORCID and Scopus information)
- » A second contribution category was added with the intent that it would differ from the first category (e.g., first category can be Research Engineer/Scientist and a second can be Technology Innovator)



Alberto Del Guerra
Chair, Fellow Search Committee

- » Added a "Standards Contributor" category
- » Changed the former "Application Engineer/Practitioner" to "Technology Innovator"

Reference Form Changes:

The fellow references were made available to the Society FEC for the first time in 2024:

- » Referee is warned that only the content of their reference will be shared with the Society/Technical Council (S/C) reviewing the nomination
- » The identity of the reference will be masked when it is sent to the S/Cs (this was not the case for 2024 as identities were recognizable)
- » Reference is asked to identify the category of each contribution

CHANGES AFFECTING THE IEEE FELLOW CLASS OF 2025

1. Nomination deadline changing from March 1 to February 7, 2024
 2. Society/Technical Council's Fellow Evaluating Committee (S/C FEC) minimum and maximum number of Evaluators (see below)
 3. Society/Technical Councils in a Cohort Fellow Evaluating Committee (CFEC) (see below)
 4. CFECs minimum and maximum number of Members (see below)
 5. S/C's Board of Governors (BoG) to submit names by September 1, 2023 for Chairs, Vice Chairs and Evaluators for S/C FECs and CFECs
- » Compliance training completed by all process participants by December 31, 2023.

Planning for these changes will require establishment of some new timelines and deadlines to receive

FUNCTIONAL COMMITTEES Cont. from PAGE 19

information from Societies and Technical Councils (S/Cs). We appreciate your cooperation in preparing for these anticipated changes.

1. Nomination deadline changing from March 1, 2024, to February 7, 2024.

To provide sufficient time for each step of the evaluation process, the due date for nominations has been moved up to February 7, 2024.

2. Society/Technical Council's Fellow Evaluating Committee (S/C FEC) minimum and maximum number of Evaluators

The number of Evaluators per S/C is computed based on the average number of nominations received within the last three years, including the current Class of 2024, and may change each cycle. The numbers include the S/C Vice Chair who is serving also in an Evaluator role. These numbers do not include the S/C Chair as they cannot serve as an Evaluator.

The following is the minimum and maximum number of Evaluators by S/C FEC for NPSS: Minimum 5; Maximum 10

3. Society/Technical Councils in a Cohort Fellow Evaluating Committee (CFEC)

The formation of Cohorts is determined based on the IEEE Board of Director's approved threshold: The average number of nominations ≥ 30 OR Membership $\geq 6k$.

A listing, by Division, defines whether S/Cs are in a Cohort or are a Standalone S/C. NPSS is in the cohort: (BT, CT, CSC, EMC, MAG, NPS, RFID)

4. Cohort Fellows Evaluating Committee (CFEC) minimum and maximum number of Evaluators

The number of Evaluators per Cohort is computed based on the average number of nominations received within the last three years including the current Class of 2024 and may change each cycle. NPSS has two Evaluators. The total number of Evaluators within the Cohort where NPSS is located is 13 + Chair.

5. Required S/C action S/C's Board of Governors (BoG)/Administrative Committee (AdCom) to submit names by September 1 for Chairs, Vice Chairs and Evaluators for all S/C FECs and CFECs.

The Division Directors will oversee the selection of the corresponding CFEC Chair. The CFEC Chair will be selected from the list of individuals serving as S/C Chairs within the specific Division. The individual may be from a Society/Technical Council within the Division that works as a standalone, preferably someone who has previous experience as a former Fellow Committee Judge.

To meet the dates required by the Board of Directors' approved enhancements, the IEEE Fellow staff will need the names of all participants and their roles in the Fellow evaluation process by September 1, 2023.

Participants include:

- » S/C FEC Chairs
- » S/C Vice Chairs
- » S/C Evaluators
- » CFEC Chairs
- » CFEC Vice Chairs
- » CFEC Evaluators

As per the Fellow Operations Manual, all S/C's Board of Governors (BoG)/Administrative Committee (AdCom),

must approve the list of names provided. The same individuals can serve on both the S/C FEC and CFEC. The Fellow Diversity Oversight Subcommittee (FDOS) will also review the list of names to begin gathering data on diversity representation.

6. Compliance training completed by all process participants by December 31, 2023

Compliance training will have to be completed by December 31, 2023 through the IEEE Learning Network (ILN) for all participants in the Fellows evaluation process. Each participant will receive an invitation from ILN to complete the Compliance Training. If Compliance Training is not completed by the deadline, the individual will not be able to participate in their role and an alternate will need to be selected

Alberto Del Guerra, CHAIR of the NPS Fellow Search Committee, can be reached by E-mail at alberto.delguerra@unipi.it

Summary of the new evaluation timeline

DATE	EVENT
September 1, 2023	All names and roles of S/C FEC and CFEC participants due to IEEE Fellow Staff
October 1, 2023	Fellow Diversity Oversight Committee (FDOS) approves S/C FEC & CFEC List of names
November 1, 2023	Nomination System Opens for the Fellow Class of 2025
December 31, 2023	Compliance Training must be completed by all S/C and CFC participants
End of January 2024	Orientations for S/C FEC Chairs, Vice Chairs and Evaluators
February 7, 2024	Nomination System Closes for the Fellow Class of 2025
February 15, 2024	System OPENS for S/C FEC Evaluation
March 30, 2024	System CLOSES for S/C FEC Evaluation
End of March 2024	Orientations for CFC Chairs, Vice Chair and Evaluators
April 7, 2024	System OPENS for CFC Discussion
May 21, 2024	System CLOSES for CFC Discussion
Middle of May 2024	S/C BoGs or AdCom Submit Fellow Search Committee Names for Class of 2026 Fellows

Search for Editor-in-Chief

IEEE Transactions on Plasma Science

Dr. Steve Gitomer, the current Editor-in-Chief of the IEEE Transactions on Plasma Science (TPS), will be retiring from that position in 2024. As a result, the IEEE Nuclear and Plasma Sciences Society (NPSS) is undertaking a search for a new Editor-in-Chief (EIC) of this journal, which is sponsored by this Society.

The scope of the IEEE Transactions on Plasma Science covers all aspects of the theory and application of plasma science. It includes the following areas: magnetohydrodynamics; thermionics and plasma diodes; basic plasma phenomena; gaseous electronics; microwave/plasma interaction; electron, ion, and plasma sources; space plasmas; intense electron and ion beams; laser-plasma interactions; plasma diagnostics; plasma chemistry and processing; solid-state plasmas; plasma heating; plasma for controlled fusion research; high-energy-density plasmas; industrial/commercial applications of plasma physics; plasma waves and instabilities; and high-power microwave and submillimeter wave generation. Additional subject areas include dusty plasmas, terahertz, electromagnetic launch science and technology, and fusion science and technology.

The Editor-in-Chief position is for a three-year term and is optionally renewable for additional terms. The term of appointment will begin in 2024 after a transition period between the current EIC and the selected applicant.

THE FUNCTION OF THE EDITOR-IN-CHIEF

Oversee the daily operations of TPS, including:

- » Recruit and manage Senior Editors
- » Assist in identifying and recruiting Guest Editors
- » Serve as a resource to Senior Editors/Guest Editors on publication policies, etc.
- » Assist as needed in appeals and dispute resolution
- » Interact with the NPSS AdCom and prepare budget estimates and reports
- » Interface with IEEE Publications
- » Monitor the quality and timeliness of the publication
- » Ensure that the TPS follows IEEE Policy and Procedures
- » Execute policies as established by the NPSS Publications Committee
- » Lead developments to enhance and strengthen the journal
- » Requirements for applicants include:
 - » Solid technical accomplishments and publication record in least one of the disciplines within the scope of TPS
 - » Exemplary service as a Senior or Guest editor, editor, or in a management capacity for an archival journal
 - » Ability and motivation to spend sufficient time to fulfill the duties of the EIC of TPS
 - » Formal support from the institution for which the nominee works (waived if self-employed)
 - » Demonstrated leadership, organizational and



Paul Dressendorfer
Publications Committee Chair

- management skills
- » Suitable temperament - ability to work at all levels including with IEEE Publications staff, TPS Editorial Board, editors, reviewers, and authors
- » Commitment to integrity and ethical standards
- » Be a member of IEEE and NPSS
- » Travel requirements, panel of Editors Meeting and AdCom as required
- » Possess an eagerness to continue to move the journal forward to higher levels of accomplishment

REQUIREMENTS FOR APPLICATIONS

- » Brief biography of applicant
- » Complete CV and list of publications of applicant
- » Brief description of how the applicant meets the requirements listed above and vision for the journal

Please submit applications in pdf format to Dr. Paul Dressendorfer (p.dressendorfer@ieee.org), Chair of the NPSS Publications Committee, no later than December 31st, 2023.

I HAD NO IDEA

I met, not long ago, a young man who aspired to become a novelist. Knowing that I was in the profession, he asked me to tell him how he should set to work to realize his ambition. "The first thing", I said "is to buy quite a lot of paper, a bottle of ink, and a pen. After that you merely have to write."

Aldous Huxley

HENCE MY WRITER'S BLOCK

What is written without effort is in general read without pleasure.

Samuel Johnson

ESCAPE LITERATURE

Reading is sometimes an ingenuous device for avoiding thought.

Arthur Helps

LITERARY LION?

Don't ask me who's influenced me. A lion is made up of the lambs he's digested, and I've been reading all my life.

George Sefferis

MY SHELF RUNNETH OVER

A book worth reading is worth buying.

John Ruskin

IGNORANCE IS BLISS

If you believe everything you read, better not read.

Japanese proverb

HENCE THESE FILLERS!

It is easier to quote poets than to read them.

Allison Barrows

FRUSTRATED

I went to a bookstore and asked the saleswoman, "Where's the self-help section?" She said if she told me, it would be defeating the purpose.

George Carlin

PENETRATING COMMENT

In the case of good books, the point is not how many of them you can get through, but rather how many can get through to you.

Mortimer J. Adler

SEEN MY DEN?

The walls of books around him, dense with the past, formed a kind of insulation against the present world and its disasters.

Ross Macdonald

Large-Scale Interposer Technology as PCB Substitute in Cryogenic Particle Physics Experiments

The nEXO experiment search for neutrino-less double beta decay ($0\nu\beta\beta$) has concluded, in 2018, that it would not be possible to use PCBs in the detector. The background decay contribution from the PCB material would prevent reaching the experiment's required sensitivity. The electronegative impurities released in the liquid xenon that quench electron lifetime also disqualify the use of PCB inside the experiment.

The goal of our project is to create a silicon equivalent to a standard Printed Circuit Board (PCB) for specialized applications like cryogenic particle physics experiments such as nEXO.

Interposers are generally used to increase signal density in electronic systems assembled in 2.5D/3D. Based on the maturity of fabrication techniques, silicon interposers have been used by the industry for nearly 15 years. The industry's needs of high bandwidth and high density also opened the door to low-loss substrate materials like glass, fused silica, borosilicate, sapphire and more.

However, many of these technologies offer only a small size ($\sim 10 \text{ cm}^2$) interposer and few redistribution layers. We therefore undertook the development of a suitable silicon interposer technology, with the collaboration of TRIUMF (Canada), and Fraunhofer IZM (Berlin). In the following we describe the design, the fabrication, and resulting interposers.

REQUIREMENTS

Taking nEXO's requirements as an example, the interposer technology must meet these requirements:

- I. Operate at cryogenic temperature: 85 K to 165 K depending on the noble gas used.
- II. Very-low radioactive background contribution in the experiment's zone of interest (Th, U, K).
- III. Tile size above $5 \times 5 \text{ cm}^2$ to provide a reasonably sized unit to tile the large area experiment (e.g., Fig. 1).
- IV. Mechanically self-supporting, holding photo-detector (SiPM or PDC) and readout electronics (e.g., Fig. 2)
- V. Maintain signal integrity (analog and digital) over the tile.
- VI. Support 10 years of continuous operation.

INTERPOSER ARCHITECTURE

Based on Fraunhofer IZM's knowhow, an architecture was defined to meet the requirements listed above. The use of tested technology blocs allowed us to reduce fabrication risks.

A silicon substrate was an obvious choice when compared with glass and fused silica for these reasons:

- I. Maturity of micro/nanofabrication on silicon.

It offers more possibilities and potentially a higher fabrication yield.

- II. High-resistivity substrate option.

In passive interposer technology, the semiconductor properties are parasitic to the circuit. However, high-resistivity wafers are available which reduce RF losses.

- III. Matched Coefficient of Thermal Expansion (CTE) with the Si-based integrated circuits.

By sharing the same CTE as the bare photodetectors and readout electronics, the induced thermal stress is minimized which benefits detector reliability and lifetime.

- IV. Radiopurity.

Silicon used in the nanofabrication industry is a good material in terms of radiopurity because of low concentrations of K, Th and U. Final products still need to be assayed to reach stringent background requirements.

From the beginning of the project, we estimated that four redistribution layers (RDL) on each side of the interposer should allow for a sufficiently complex routing scheme. Furthermore, the technology must have Through Silicon Vias (TSVs) to allow interconnects between both sides of the interposer. For example, this is key to connect photodetectors on top of the interposer with the electronics on the bottom.



Keven Deslandes
NPSS Student Paper Award Recipient, 2022

To solve many fabrication issues, we decided to form the interposer out of two silicon wafers of identical structure.

First, by doing so, the global architecture becomes symmetric, thereby providing the best immunity to deformation due to residual thin film stresses.

Second, a good structural integrity can be achieved while minimizing each wafer's thickness. This is crucial for the TSV-last process we use because it reduces the TSV depth, easing fabrication and reducing TSV diameter (maintaining a low TSV depth-to-diameter ratio).

Third, as seen in Fig. 3, the TSVs are annular and empty causing important challenges to further microfabrication steps on the back side of each wafer. By reducing the number of fabrication steps on the back side to only the bonding CuSn layer, we hope to increase the yield.

Lastly, because both wafers have the same structure, they can be processed simultaneously even if they don't have the same circuit patterns.

With the use of two different dielectrics, PECVD SiO_2

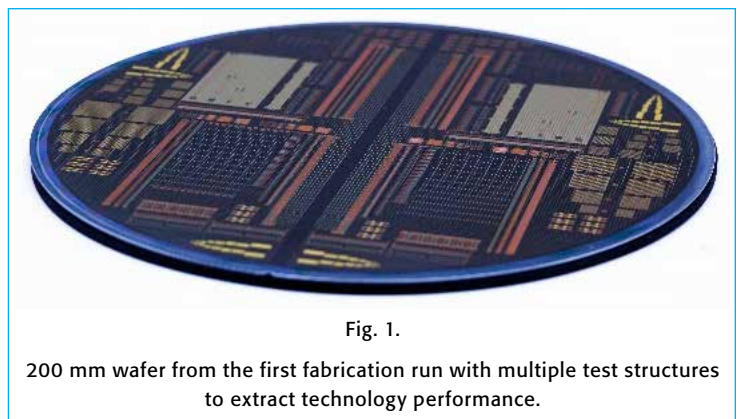


Fig. 1.
200 mm wafer from the first fabrication run with multiple test structures to extract technology performance.

and spin-coated Polyimide (PI), it was possible to form four redistribution layers: two layers of 3- μm -thick Cu separated by 0.5- μm PI with two layers of 1- μm -thick AlSi separated by 1- μm of SiO_2 . In the middle of the interposer (i.e., between both wafers), two layers of 5- μm of Cu are available for TSV interconnects and signal routing. The two wafers are bonded with CuSn pads. Having multiple materials and thickness enables features like power mesh decoupling, 50 ohms coplanar transmission lines, low-resistive analog lines, etc. The objective is to give to circuit designers a versatile technology to be used in multiple applications.

FIRST PRODUCTION RUN AND RESULTS

A first lot of 25 wafers was fabricated by Fraunhofer IZM between 2019 and 2021. Since this architecture is new, multiple process splits occurred during the fabrication to validate the fabrication and optimize the parameters.

The wafers from this first fabrication phase were characterized at the Interdisciplinary Institute for Technological Innovation of the Université de Sherbrooke. Technology performances like sheet resistivity, dielectric leakage, via resistivity, layer capacitance and more were extracted from the measurements. We have included them in the CAD technology kit to enable a second run of design and fabrication with more precise material details. It also allows distributing to collaborators.

An impressive achievement in this project is that the fabrication was successful on its first fabrication phase. This confirms our choices of relying on known technology blocs. From the 25 wafers, 21 were delivered, and the four remaining wafers were used at the IZM foundry for destructive inspection.

FUTURE WORK: SECOND PRODUCTION RUN

From the various physical inspections and electrical characterization during the project's first phase, a few improvements will be made to the architecture and the fabrication recipes:

1. Substrate thickness will be reduced to 250 μm to reduce TSV diameter and ease fabrication.
2. The integrity of the dielectric layer between the first two metal layers to increase the yield of highly overlapped structures.

To evaluate the impact of these improvements, a second production run will occur. The second production run will contain fewer test structures and demonstrate its functionality as a large-scale interposer by interfacing multiple photodetectors (PDCs and SiPMs) and connecting them to either readout circuits or cables and connectors.

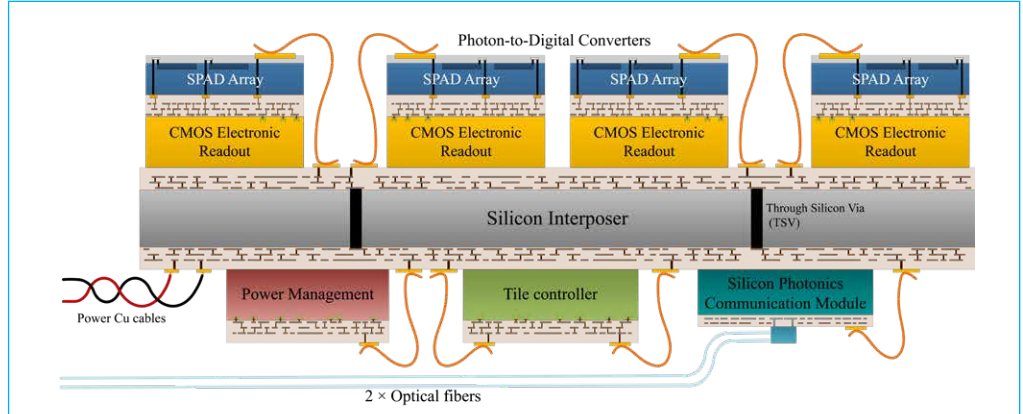


Fig. 2 Side view of Sherbrooke's proposed PhotoDetection Module for the construction of large area photo-detector planes

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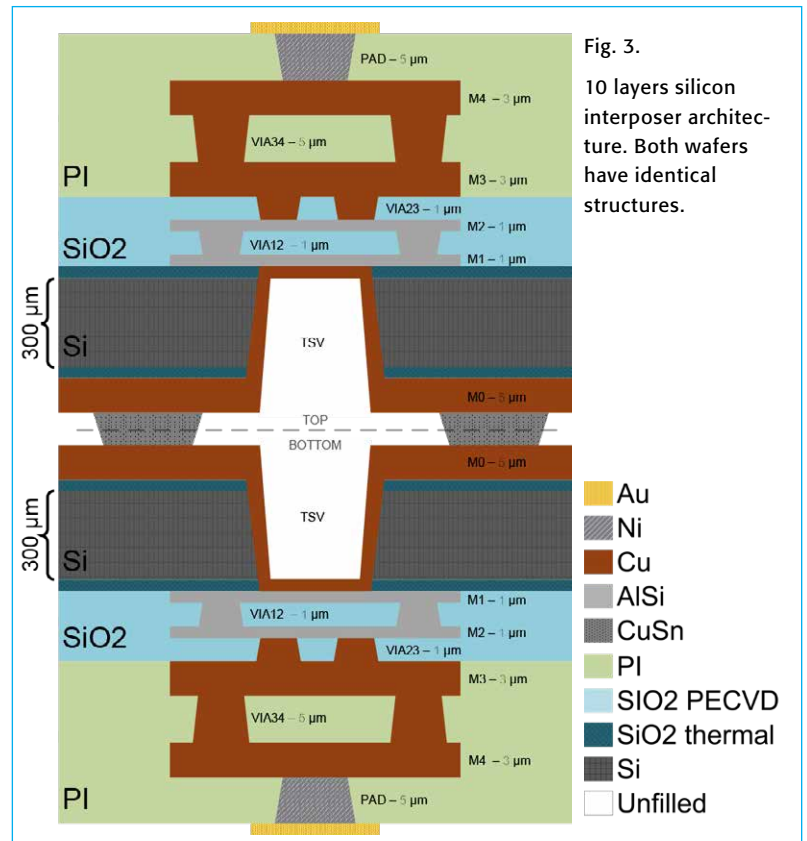
With the financial support of NSERC and the IEEE, I was able to attend the IEEE NSS-MIC RTSD 2022 in person. I'm grateful for the child support I received for the conference which made this professional experience all the more possible. This opportunity to meet colleagues in my field of work was a wonderful experience. I am grateful that I was selected to present my project in an oral presentation in the NSS Analog and Digital Circuits session. A special thanks to the jury that selected me for the IEEE Best Student Paper Award 2022 which gave me the opportunity to write this article for the prestigious NPSS newsletter.

RESEARCH GROUP: GRAMS

The GRAMS research group is led by Professors Jean-François Pratte, Serge Charlebois, Réjean Fontaine, Marc-André Tétrault, Audrey Corbeil-Therrien, and Jean-Baptiste Michaud. GRAMS includes over 70 undergraduate interns, graduate students, postdoctoral students and the scientific staff. Our expertise is the design of Application Specific

Integrated Circuits (ASIC), the design, fabrication, and characterization of single-photon detectors (Photon-to-Digital Converter - PDC) [1], the development of time-to-digital converters (TDC), and FPGA implementation. We devote our expertise to medical imaging, particle physics experiments, high-energy particle detection and quantum communication. The GRAMS is as always open to collaboration and devoted student application. Please don't hesitate to reach out at the email address at the end of the article.

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ARTICLE

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ACKNOWLEDGMENTS

The author, Keven Deslandes, a Ph.D. student in Electrical Engineering, and a member of the GRAMS, expresses his thanks to the following:

- » Pr Jean-François Pratte as a research director and a mentor. Professor at Université de Sherbrooke.
- » Professor Serge Charlebois as a research director and a mentor. Professor at Université de Sherbrooke.
- » Dr Fabrice Retière as a loyal project collaborator. Senior Scientist at TRIUMF.

- » nEXO Collaboration to support this work as a potential candidate for the photodetection module.
- » NSERC for funding this project through research grants and scholarship.
- » FRQNT for funding this project through scholarship.
- » McDonald Canadian Astroparticle Physics Research Institute for providing tools, training, and research grants.
- » Canadian Funds for Innovation for funding this project through research grants.
- » IEEE for providing a trainee grant and a child support grant at IEEE NSSMIC RTSD 2022 in Milan.

The research group can be reached by E-mail at Grams3D-Info@USherbrooke.ca

REFERENCE

[1] J.-F. Pratte et al., "3D Photon-To-Digital Converter for Radiation Instrumentation: Motivation and Future Works", *Sensors*, vol. 21, no. 2, p. 598, 2021.

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