

NPSS NEWS

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ELECTRONICS ENGINEERS



SEE PAGE 2

SOFE-2017: Symposium on Fusion Engineering

Join us in Shanghai!
4th–8th June 2017



Hutch Neilson
General Chair

Every two years, the IEEE Symposium on Fusion Engineering (SOFE) attracts fusion engineers and scientists from around the world to exchange information and keep up to date with the latest advances in fusion research and development. In 2017, the Symposium will move outside the United States for the first time in its 52-year history. The 27th SOFE will be held in Shanghai, one of China's most vibrant and cosmopolitan cities. The decision by the Fusion Technology Standing Committee (FTSC) to go to China recognizes the rapid growth in fusion research and advanced engineering in that country, and the growing participation of Chinese researchers in SOFE in recent years.

The Symposium, which will be held 4th–8th June 2017 at the Marriott Shanghai City Centre Hotel, will feature papers on the full range of fusion engineering

topics, including magnets, power systems, plasma-facing components, fueling, plasma exhaust, control, heating, and diagnostics, to name a few. Progress reports on the world's major fusion plasma experiments have become a mainstay of SOFE and the participation of leading fusion scientists helps to foster good communication between physicists and engineers. The Symposium has kept pace with the evolution of fusion research from laboratory-scale experiments to large industrial-scale facilities such as the National Ignition Facility and ITER, and its scope now extends to topics such as project management, system integration, and fusion roadmap planning, while still maintaining its primary focus on fusion's challenging engineering problems and their solutions.

A highlight of the 2017 SOFE will be a special emphasis on education, both for students and for experienced researchers wishing to broaden their knowledge. The conference will offer five minicourses on topics of timely importance in the field: Plasma-Material Interactions, Stellarators, Plasma Diagnostics, Fusion Radiation Effects on Electronics, and Inertial Fusion Energy. To encourage students to attend and present their work at SOFE, the conference has established a fund to help with their travel and registration expenses. And a concerted effort is under way to raise awareness of the Best Student Paper Award and its ultra-simple application procedure, namely checking a box on the abstract submission form! Applicants for the participation grants or student paper award must be IEEE student members to be eligible. Along with support for students, we will also recognize our

experienced researchers and leaders by announcing the recipients of Fusion Technology Awards for both 2016 and 2017.

The 2017 Symposium will offer an exciting social program for attendees and companions, providing glimpses of Chinese cuisine and culture. A Welcome Reception, Women in Engineering Reception, Conference Banquet, and tours of Shanghai and nearby venues will make this historic SOFE a memorable one.



Jiangang Li
General Co-chair

The 2017 SOFE is sponsored by NPSS, with the IEEE Shanghai Section and the Institute of Plasma Physics of the Chinese Academy of Sciences (ASIPP) as technical cosponsors. Conference planning is well under way, led by Hutch Neilson and Jiangang Li as General Chair and Co-chair, respectively, and guided at every step by FTSC Chair Charles Neumeyer. The technical program is being planned by an international committee led by Paul Humrickhouse and Yuntao Song as Program Chair and Co-chair,

CONFERENCES Continued on PAGE 2

CONFERENCES

ANIMMA 2017	2
ICOPS Conference Report	3

SOCIETY GENERAL BUSINESS

President's Report	4
Secretary's Report	4

TECHNICAL COMMITTEES

Computer Applications in Nuclear and Plasma Sciences	4
Nuclear Medical And Imaging Sciences	4
Radiation Effects News	5

FUNCTIONAL COMMITTEES

Awards	5
--------	---

LIAISON REPORTS

Educational Activities Board	
EAB Liaison	6
University Programs Partnership	6
IEEE Smart Village	7

ARTICLES

On The Way to a Unified Communication Framework	7
2017 Student Challenge	8
Navigating the New Era of Chip Card Technology	9

Conferences Continued from PAGE 1

respectively, and ASIPP Director Baonian Wan chairs the local organizing committee. Registration and abstract submission opened in November, and further details about the Symposium are available at <https://sofe2017.princeton.edu/>.

DOWN TO EARTH

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

Samuel Johnson



Yuntao Song
Program Co-chair



Charles Neumeyer
FTSC Chair



Paul Humrickhouse
Program Chair

A Special Message from the 2015 and 2017 ANIMMA Chairman



Abdallah Lyoussi
General Chair 2015, 2017

Dear Colleagues and Friends,

Nuclear instrumentation and measurement are key aspects that contribute to the quality of scientific programs in the fields of physics, energy, fuel cycle, waste management, safeguards and homeland security. Furthermore, measurements relying on nuclear physics now play an important role in various fields of application such as biology, medicine and the environment.

Since the first conference in 2009, the ANIMMA* international conference continues to provide an excellent opportunity to get together with colleagues, partners and friends to exchange ideas and share knowledge and experience in nuclear instrumentation, measurement methods and nuclear

experimental sciences in general. The ANIMMA Conference has strived, from the beginning, to create a special meeting place for all those working in nuclear instrumentation and its applications as we strongly believe that cross-border exchanges among scientists, engineers and industrialists can only lead to the most thoroughly developed ideas, the best solutions and the most efficient collaborations and partnerships. 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. It is an ideal



meeting ground for scientists and engineers in the fields of nuclear measurement, instrumentation in severe/harsh media, radiation instrumentation, software engineering, data acquisition analysis and treatment, and related applications to present their work and network with their colleagues from around the world.

ANIMMA 2015 was a success thanks to your contributions and to your participation and also many thanks to local organizers as well as ANIMMA committees; partners and sponsors. More than 300 presentations and posters were presented and discussed in addition to a regular exhibition with over

10 stands from industry and research institutes. Over 400 participants attended the conference. Short-courses and workshop initiatives were also very successful.

Finally I would like to thank all attendees for having made this scientific event a success.

Looking forward to meeting you at ANIMMA 2017

Abdallah Lyoussi, General Chair, ANIMMA 2015 and 2017, can be reached by E-mail at abdallah.lyoussi@cea.fr

ANIMMA International Conference

Liège, Belgium, June 19th -23rd, 2017

The fifth international conference on Advancements in Nuclear Instrumentation Measurement Methods and their Applications (ANIMMA) is being organized by SCK-CEN, the Belgian Nuclear Research Center, in partnership with CEA (French Atomic and Alternative Energies Commission), Aix Marseille University and is scientifically cosponsored by IEEE/NPSS. It is the successor to the previous highly successful conferences: Marseille (2009), Ghent (2011), Marseille (2013) and Lisbon (2015). ANIMMA 2017 will take place from 19th to 23rd June 2017 at the Palais des Congrès in Liège, Belgium. Liège is located on the river Meuse, less than 100 km from Brussels and can be reached easily by plane, train or car.

The conference deals with nuclear instrumentation and measurements in various application fields such as:

- » Fundamental physics
- » Fusion diagnostics and technology
- » Advanced Nuclear Energy Systems
- » Research reactors
- » Nuclear fuel cycle
- » Decommissioning, dismantling and remote handling

- » Safeguards, homeland security
- » Severe accident monitoring
- » Environmental and medical sciences
- » Education, training and outreach

The ANIMMA Conference brings together scientific, academic and industrial communities interested, or actively involved in research and developments related to nuclear instrumentation and measurement methods. The program is focused on instrumentation, but emphasizes the latest developments in all measurement stages: nuclear radiation detection and measurements, modeling, electronics, signal acquisition and analysis, interpretation and associated training/education activities.

ANIMMA offers an outstanding opportunity for scientists and engineers to meet and discuss new ways to address complex problems and find advanced solutions in nuclear instrumentations and measurement sciences and technologies.

The conference will include plenary talks by distinguished speakers, invited and oral presentations; poster session contributions will be supported by intensive oral presentations in parallel sessions. On the day before the main conference, workshops on several hot topics will be organized, as well as a one-day short courses session, leading

students from the basic physics through a selection of advanced nuclear instruments and applications. Throughout the entire conference, a technical exhibition will be available to the participants. There is also an opportunity to organize satellite meetings within the scope of the conference.

You are strongly encouraged to submit abstracts via the conference website <http://www.animma.com>. All papers presented at the ANIMMA 2017 meeting whether oral or poster, will be published in the Conference Record. The Conference Record (CR) is the official repository for manuscripts presented at the ANIMMA 2017 Conference and will be available to all registered Conference attendees as a file for download. The CR will also be submitted to IEEE Xplore for formal publication. In addition extended papers may be submitted to the regular IEEE *Transactions on Nuclear Science* or the IEEE *Transactions on Plasma Science* for peer review and archival publication.

As in 2015, we will promote the young generation by selecting the two best student papers for a special award.

KEY DATES

Abstract submission deadline: November 4, 2016

Notification of acceptance: March 10, 2017

Final paper submission deadline: June 1, 2017

Open registration: January 5, 2017

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NUCLEAR & PLASMA SCIENCES SOCIETY NEWS

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Conference Report: ICOPS 2017 Banff, Alberta, Canada, June 2016

The ICOPS 2016 IEEE Women in Engineering (WIE) event was a great success, attended by over 70 students and other researchers.

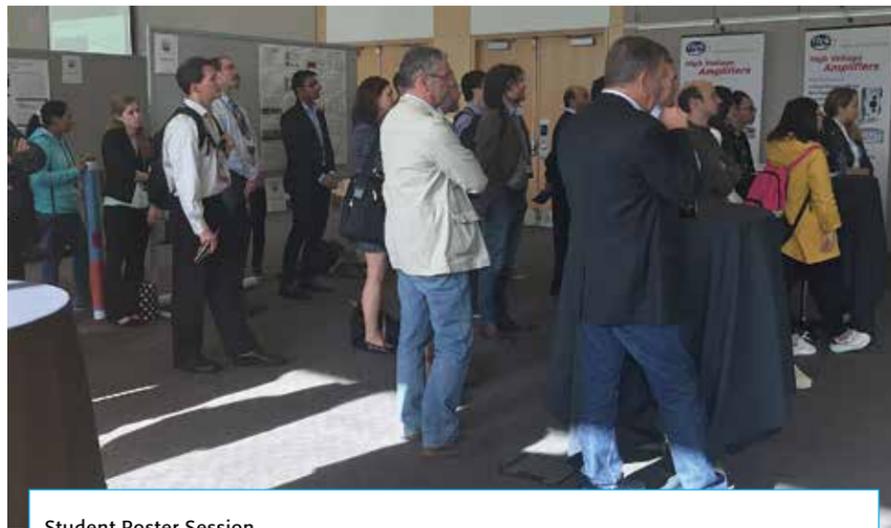
At this event, Dr. Christine Coverdale (Sandia National Lab), Dr. Mingshen Wei (General Atomics) and Dr. Manisha Gupta (University of Alberta) shared with the audience their experiences as female scientists and engineers in work and life. After the talks the attendees enjoyed the good food and drinks and mingled with the speakers and each other. The IEEE NPSS Young Professionals event at ICOPS 2016 was a student and young researcher poster symposium. This was a pilot project supported financially by the NPSS YP initiative. The purpose of the event is to help in connecting and enhancing interactions among students and young researchers and potential employers. The event was well attended by students and young researchers, other conference attendees and representatives from over 20 organizations including industrial companies, government laboratories and universities. The event started with a motivating talk by Dr. Kevin Ilcisin who received his doctoral degree in plasma science from Princeton University and is Vice President of National Instruments. After the keynote speech, student and young researchers from around the globe presented their work and mingled with potential employers.



Amanda Loveless was presented the Outstanding Paper award



Bret Scheiner, David Yager-Elorriaga, Vighneswara Siva Santosh Kumar Kondeti received awards for best paper



Student Poster Session.



Ying Tsui received enthusiastic applause and a plaque for chairing ICOPS 2016

ICOPS WIE Event Presenters



Christine Coverdale
Sandia National Lab



Dr. Manisha Gupta
University of Alberta



Dr. Mingsheng Wei
General Atomics



2016 IEEE Igor Alexeff Outstanding student award was presented to Andreas Schlaich.



Young Professionals event with guest speaker.



Christine Coverdale receiving the PSAC 2016 Award.

PRESENTS OF MIND

The books we think we ought to read are poky, dull and dry;
The books we would like to read we are ashamed to buy;
The books that people talk about we can never recall;
And the books that people give us, oh, they're the worst of all.

Carolyn Wells

AHEAD OF HIS TIME

War must be made as deadly to the civilian population back home as it is for the troops in the front lines. Let the sword of Damocles hang over every head, gentlemen, and you will witness a miracle – all wars will be stopped instantly if the weapon is called bacteriology.

Alfred Nobel

MUTUAL UNDERSTANDING

We were in agreement that the danger of nuclear war was great, but Teller meant that the danger was great if the U.S. government should listen to me, and I meant the danger was great if the U.S. government should listen to him.

Leo Szilard

SAUCE FOR THE GOOSE

Of course scientists have been told to be socially responsible. Of course, I think society ought to be socially responsible too.

Sydney Brenner (Nobel Laureate)

President's Report



John Verboncoeur
IEEE NPSS President

This is my final report as NPSS President, and it has been quite a ride. In looking back, NPSS has accomplished many things. We saw both the Particle Accelerator Science and Technology (PAST) and Pulsed Power Committees move from appointed to elected status. Both have seen volunteer participation and enthusiasm increase, and quality leadership emerge. We have also seen the enhancement of our existing journals, *Transactions on Plasma Science* and *Transactions on Nuclear Science*, with monthly curated email blasts highlighting a few key papers and providing temporary open links to those papers. In addition, the creation of the *IEEE Transactions on Radiation and Plasma Medical Sciences* (T-RPMS) with our partners in the IEEE Engineering

in Medicine and Biology Society is well underway, and accepting articles for its inauguration early in 2017. We are pleased to have Dimitris Visvikis as the inaugural Editor-in-Chief of T-RPMS, he is energetic and knowledgeable. Please provide your support to ensure the success of all our journals, through submitting your best papers, serving as reviewers, editors, and adjudicators, and of course enjoying the quality papers.

In October, I had the pleasure of attending the IEEE NPSS North American Particle Accelerator Conference, in Chicago, IL, USA. As usual, the conference had an excellent technical program, which included tutorial sessions to help attendees move into new areas. The meeting, a joint venture between IEEE NPSS and the American Physical Society Division of the Physics of Beams, holds an evening session called Women in Science and Engineering (WISE). At the WISE event this year, the approximately 200 attendees enjoyed an excellent series of speakers and a video showcasing key statistics, narrated by successful women in the field, followed by discussion and dinner. We are hoping to get the video posted to the NPSS web page.

I am pleased to let you know that the members rejected the proposed IEEE Amendment in the

recently completed IEEE election. Not only did the Amendment not achieve the two-thirds supermajority needed to pass, it in fact was rejected by a majority of voters. Given the clear message sent by members, we hope there will be a move to reform the IEEE initiative process, and a move to increase the transparency and openness in the upper levels of the IEEE. In particular, we hope to put in place mechanisms for open debate of initiatives, including presentations of both perspectives and even debates between those holding opposing viewpoints, with the intention of holding a contest of ideas. This seems like an excellent way for the IEEE to develop the best ideas, and the best leaders to present them.

We hope to make modifications to the governing policies to lock in the fundamental principles of the IEEE as a volunteer-governed organization within the Constitution, with the details implanting that vision within the Bylaws. We may call upon you in the future to help to ensure these policies are of the highest quality, after open and thoughtful discussion. For those with passion about these areas, we welcome your participation in the process.

We hope to clarify the ethical process, so that participants understand the importance of delegating any decisions governing the process when they are also participants. This is crucial for retaining your trust, and for ensuring the emergence and survival of the strongest ideas in the crucible of public discussion.

I do not yet know what role, if any, I might have in building the future of the IEEE, but I hope many of you will be motivated to volunteer and make a difference, which is indeed the fundamental spirit of the IEEE. I also ask for your support for my successor, affirmed at the November NPSS Administrative Committee meeting, Vice President Stefan Ritt. Stefan brings new ideas and new initiatives to NPSS, and I look forward to continuing to work with him.

I am grateful to all those who mentored and advised me these past years, including the NPSS senior leadership team of Hal Flescher, Peter Clout, Bill Moses, Craig Woody, Jane Lehr, and Albe Larsen. A special thanks go to my predecessor, Janet Barth, who set a great example and provided excellent advice and opportunity. Thanks to Ron Keyser, whose dedicated service as Treasurer led to many fiscal improvements; he hands the treasury baton to Ralf Engels. Finally, I would like to thank the NPSS membership for your trust, attention and support over the past two years, it has been a great honor for me to do my small part.

Sincerely,

John Verboncoeur, NPSS President
John Verboncoeur, IEEE NPSS President, can be reached at johnv@msu.edu

Secretary's Report



Albe Larsen
IEEE NPSS Secretary
and Newsletter Editor

The NPSS AdCom will meet in Strasbourg, France, on Saturday, November 5th, too late for a report in this Newsletter. At that time we will learn more about the first edition of our journal, *IEEE Transactions on Radiation and Plasma Medical Sciences*. In November we will also say goodbye, along with a heartfelt "thank you" to AdCom members whose terms are ending. These are Ron Jaszczak representing NMISC, as well as Christian Bohm, representing the Transnational Committee, Brendan Godfrey representing PSAC and Mark Tillack representing the Fusion community. The latter three have all served partial terms. In January we will welcome the following new members: Dennis Youchison (Fusion), Vesna Sossi, (NMISC), Brendan

Godfrey (PSAC) and Christian Bohm, both returning for full terms. These individuals as well as our new officers and technical committee chairpersons will be recognized in the March 2017 edition of this Newsletter, along with brief biographies of our 2017 class of Fellows. At that time I will also report on other details of the November 5th meeting.

During this past election several technical committees also elected new members. These will be reported by the technical committee chairs.

As 2016 draws to a close, we wish you all the happiest, healthiest holiday season and a bright New Year, and urge your continued support and participation in NPSS activities.

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

THAT EXPLAINS IT!

A Democrat sees the glass of water as half full. A Republican looks at the same glass and wonders who the hell drank half his glass of water.

Jeff Cesario

BUT, TO WHAT END?

There is no truth, only progress

Karl Pepper

FUNDAMENTAL

Upon the highest throne in the world, we are seated, still, upon our arses.

Michel de Montaigne

Technical Committees



Martin Purschke
Chair, CANPS Technical Committee

COMPUTER APPLICATIONS IN NUCLEAR AND PLASMA SCIENCES

Most members of the "Computer Applications in Nuclear and Plasma Sciences" (CANPS) committee have enjoyed a short break after the hectic pace of the very successful 20th Real-Time Conference, which was held in Padova, Italy in June. In the meantime, the distinguished lecturers and others from CANPS (Stefan Ritt (PSI), Christian Bohm (Stockholm), Patrick Le Dû (IN2P3-CNRS), Masaharu Nomachi (Osaka), Youichi Igarashi (KEK), Zhen-an Liu (IHEP), and I have helped organize and run the International School in Real-Time Systems in Ho Chi Minh City, Vietnam. A school such as this is a great way to foster interest in our fields of research. We will have a longer report about the school in a future issue of this newsletter.

Today we have a short feature about our CANPS award winner, Roger Lecomte from the Université de Sherbrooke. Also, staying with the tradition started at the last Real-Time, we are beginning a series of articles from our student award winners about their award-winning research, one article at a time. The first contribution is from Dominic Gaisbauer from the Technical University, Munich in Garching, Germany. He won the award for his paper called the "Unified Communication Framework." Dominic holds bachelor and master degrees in Applied and Engineering Physics from the Technical University of Munich, and is currently working on his Ph.D. with the PENeLOPE apparatus, a precision experiment that strives to improve our knowledge of the neutron lifetime by about an order of magnitude to about 100 ms. A more precise knowledge of neutron lifetime will allow more stringent tests of the Standard Model by giving access to fundamental parameters of the weak interaction. Dominic is one of the senior graduate students and one of the project leaders of the PENeLOPE experiment. You will find the article about his award-winning research later in this issue.

Behind the scenes, the preparations for the next Real-Time conference are underway. The conference will come back to the U.S. and will be held 10th – 15th June 2018 in Williamsburg, Virginia. It will be hosted by Jefferson Laboratory and chaired by David Abbott. Please stay tuned for updates.

Martin Purschke, Chair of the CANPS TC, can be reached by E-mail at Purschke@bnl.gov

NUCLEAR MEDICAL AND IMAGING SCIENCES

At the time of writing what promises to be a very exciting IEEE NPSS Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) is about to take place in Strasbourg. Thanks to the organizing committee for all the hard work that has gone into arranging it. Looking forward, next year's meeting will be in Atlanta, Georgia, U.S.A., with John Aarsvold as General Chair and Lars Furenlid and Matthew Kupinski as MIC Chair and Deputy Chair. Reflecting a general ambition of having the meeting hosted more frequently in Europe and the Far East, 2018 will see us for the first time in Sydney, Australia (General Chair Anatoly Rozenfeld, MIC Chair and Deputy Chairs Steve Meikle and Taiga Yamaya), and in 2019 the NSS/MIC will for the first time come to the UK (geographically at least the UK will still definitely be part of Europe!) and will take place in Manchester. 2020 will see the meeting back in the U.S., the preferred location being somewhere in the North East. Many of you will also be interested in the 2017 Conference on PET-MRI and SPECT-MRI ('PSMR') which will take place between the 29th and 31st of May in Lisbon, Portugal.

Three awards were presented at the annual meeting. This year's winner of the Bruce Hasegawa Medical Imaging Conference Young Investigator award is Joyita Dutta (University of Massachusetts Lowell, Harvard Medical School and Massachusetts General Hospital) for her contributions to image

reconstruction and analysis for molecular and multimodality imaging in the areas of positron emission tomography (PET/CT and PET/MRI) and fluorescence tomography.

The 2016 Edward J. Hoffman Medical Imaging Scientist Award was presented to David Townsend (National University of Singapore) for his pioneering contributions to the field of applied medical physics by innovating, managing and introducing new imaging instrumentation and scientific contributions to data acquisition, image reconstruction and imaging system design.

This year the 2016 IEEE Marie Skłodowska-Curie Award (for which all members of the NPSS community are eligible) was also awarded to a Medical Imaging Scientist, Simon Cherry from UC Davis, for his contributions to the development and application of *in vivo* molecular imaging systems.

Congratulations to all three award winners!

The newly elected Council members starting their three-year terms from 1st Jan 2017 are Dimitra Darambara, Cristina Lois, Charalampos Tsoumpas, Glenn Wells and Larry Zeng. I would like to welcome them and will endeavor to help them make a significant contribution within the NMISC. I would also like to thank those who did not get elected this year and encourage them as well as others to volunteer in next year's elections.

Thanks to all those who have either volunteered or proposed candidates for awards - I would like to encourage you all to nominate worthy colleagues from our community for the many awards which

are available from IEEE and NPSS with deadlines at end of January 2017. More details can be found at <http://ieee-npss.org/awards/npss-awards/> and <http://ieee-npss.org/awards/ieee-awards/>.

Hopefully everyone is now aware of the new NPSS journal *IEEE Transactions on Radiation and Plasma Medical Sciences* (TRPMS) and the first, January 2017, edition should appear imminently.



Paul Marsden
Chair, Nuclear Medical and
Imaging Technical Committee

TRPMS will be published in cooperation with the Engineering in Medicine and Biology Society (EMBS) and will be indexed in PubMed. The journal is a long-awaited development with the aim of creating a unique publication related to the application of radiation and plasma sciences within the medical field. Topics covered correspond to all the areas covered by the research themes of NMISC and the Medical Imaging Conference - radiation detectors for medical and biological applications; imaging system design/optimization/performance; therapy-related system design/optimization/performance; PET/SPECT/CT image reconstruction, data analysis and image processing; medical radiation therapy applications; clinical/preclinical evaluation of imaging and therapy systems; simulations for imaging and therapy applications. Educational material such as technical/clinical review papers covering these areas will also be included. We strongly encourage authors to submit their work to TRPMS at <https://>

mc.manuscriptcentral.com/trpms.

Paul Marsden can be reached at the Division of Imaging Sciences and Biomedical Engineering, King's College London, St Thomas' Hospital, London, SE1 7EH, UK; Phone: +44 (0)20 718 53208; E-mail: paul.marsden@kcl.ac.uk

RADIATION EFFECTS NEWS

Annual report from the Radiation Effects Committee – July 2016

Allan Johnston, J-K Associates, is the present Chair of the Radiation Effects Steering Group, which oversees NSREC Conferences.

The IEEE Radiation Effects Committee (REC) held its annual Open Meeting on July 12th, 2016, at the Oregon Convention Center, Portland, Oregon, during the 2016 Nuclear and Space Radiation Effects Conference (NSREC). The meeting included presentations from the general chairs of the 2015 through 2017 NSRECs.

An election was held during the Open Meeting for a new Junior Member-at-Large to the Radiation Effects Steering Group (RESG). The RESG welcomed Ethan Cannon, Boeing, as the newly elected Junior Member-at-Large. Ethan joins Simone Gerardin, University of Padova and Tom Turlinger, Aerospace Corporation, who are serving as Senior-Member-at-Large and Member-at-Large, respectively.

During the Open Meeting, Allan presented an award to Sylvain Girard, Université de Saint Etienne, the outgoing Senior Member-at-Large. Awards were also presented to Kay Chesnut, Boeing, for her service as an elected member of AdCom, and Martha O'Bryan, for her service in developing and updating the NSREC website.

Allan announced the general chairs for upcoming NSRECs: Véronique Ferlet-Cavrois, European Space Agency, Ronald Lacoé, The Aerospace Corporation, and John Stone, Southwest Research Institute, for the 2017-2019 NSRECs, respectively.

Robert Reed, Vanderbilt University, 2016 Conference General Chair, summarized some statistics for the 2016 conference. A total of 457 people attended the technical sessions and 280 people attended the short course. In addition, 72 exhibitor staff and 166 guests were registered. The technical sessions were very strong, with 156 papers presented during the four-day conference (49 oral presentations, 54 posters, and 53 Data Workshop). There were four outstanding tutorial reviews given during the Short Course on July 9th. Short Course attendees also received a CD and memory stick of the Short Course presentations. The industrial exhibit, which had 49 exhibitors, was well attended.

Véronique Ferlet-Cavrois, European Space Agency, 2017 Conference General Chair, announced that NSREC will be held July 17th – 21st, at the Marriott, New Orleans. This conference will feature a technical program consisting of ten sessions of contributed papers (both oral and poster) that describe the latest observations and research results in radiation effects, a Radiation Effects Data Workshop, and an industrial exhibit. Attendees will also have the opportunity to participate in a one-day Short Course on Monday, July 17th. The theme for the short course prepared by Jonathan Pelly, NASA/GSFC, is "Hardness Assurance for Satellite Systems: From Macro to Nano-Satellites." The short course presenters include:

- » Christian Poivey, European Space Agency
- » Ray Ladbury, NASA/GSFC
- » Michael Swartwout, Saint Louis University
- » Dave Roth, Johns Hopkins Applied Physics Lab

The short course should be of interest to both radiation effects specialists and newcomers to the field.

For the most current information on the Nuclear and Space Radiation Effects Conference, including information on paper submission, please visit www.nsrec.com.



Allan Johnston
Chair, Radiation Effects TC

For further information contact either Allan Johnston, RE chair at johnstonah25@gmail.com or Teresa Farris, VP Publicity at teresa.farris@cobham.com.

ALL IN A GOOD CAUSE

Learning carries within itself certain dangers because out of necessity one has to learn from one's enemies.

Leon Trotsky

HOW ABOUT POLITICIANS?

The quality of our thoughts is bordered on all sides by our facility with language.

J. Michael Straczynski

NO GEOGRAPHY LESSONS NOW

The trouble with our age is that it is all signpost and no destination.

Louis Kronenberger

Functional Committees



Craig Woody
Awards Committee Chair

AWARDS

We are now soliciting nominations for our NPSS Awards for 2017. NPSS offers a number of awards for exceptional contributions to our field or our Society. These range from the highest IEEE level awards, such as the IEEE Medal for Healthcare Innovations and Technology and the IEEE Marie Skłodowska-Curie Technical Field Award, to various Technical Committee and Conference awards. Information about all of these awards can be found on the NPSS website <http://ewh.ieee.org/soc/nps/awards.htm>. The due dates for nominations vary according to the award, but the NPSS Society-level awards are generally all due at the end of January of next year. However, it takes time to put together an effective nomination, so it's time to start thinking about possible candidates and working on those nomination packages before the end of this year. Tips on how to write a successful nomination are given on our website.

A number of grants sponsored by NPSS are designed to help students and young researchers in our field. Starting in 2017 we will be offering two new grants for our younger members. These are the Glenn F. Knoll Graduate Education and Post

Doctoral Education Grants. These two new grants were made possible by the generous donations of Mrs. Gladys Knoll, widow of our well known and beloved educator and long standing member of NPSS, Prof. Glen Knoll, and Dr. Valentin Jordanov, one of Prof. Knoll's highly successful students. These grants are intended for outstanding graduate students and postdocs in the field of nuclear science instrumentation, medical instrumentation, or instrumentation for security applications to support travel and attendance to conferences, workshops or summer schools, or special research projects. Details on how to apply for these grants will be given on the NPSS Awards website. There are also various other grants available for NPSS members. The Paul Phelps Continuing Education Grants provide funds for postdocs and unemployed NPSS members to cover the cost of tuition and other expenses for Short Courses offered at NPSS conferences. We also offer NPSS Student Paper Awards for outstanding student contributions at many of our conferences. Details on how to apply for these awards and the Phelps Grants are also given on the NPSS website. There are also numerous Technical Committee awards, as well as conference awards and travel grants, that are related to specific Technical Committees and conferences. Details for these awards are found on the individual conference or Technical Committee websites.

Please start thinking about nominating one of your colleagues, or yourself, for one of the many NPSS awards or grants (self nominations are allowed for some of the awards... just check the details to be sure). The deadlines approach rapidly by the end of the year and it takes time to put together a good nomination package. It's a great opportunity to recognize some of the many outstanding colleagues



Roger Lecomte receives CANPS Award, presented by Martin Purscke (right), CANPS chair.

in our field and to raise the level of prestige of our Society.

Craig Woody, Chair of the NPSS Awards Committee, can be reached by E-mail at woody@bnl.gov.

Meet the 2016 CANPS Award Winner, Roger Lecomte

Every two years, at the Real-Time Conference, the Computer Applications in Nuclear and Plasma Sciences technical committee honors the winner of the CANPS award. This year, the long list of distinguished awardees got extended with the name of Roger Lecomte from the Université de Sherbrooke, Quebec, Canada.

Indeed, Roger has a long list of outstanding contributions to the field of PET and Medical Imaging in general. He received his Ph.D. in Experimental

Nuclear Physics from the Université de Montréal, and began to build a team of scientists and engineers at the Université de Sherbrooke in 1981, working on advanced, small-animal, medical-imaging devices based on Positron Emission Tomography. Together with Dr. Robert J. McIntyre, inventor of the Avalanche Photodiodes (APDs) at RCA Optoelectronics, he pioneered the development of solid-state detectors for PET, and went on to implement them in the highly successful Sherbrooke APD PET scanner for high-resolution small-animal imaging. He also introduced new ideas and new techniques, such as depth-of-interaction (DOI) and physical response modeling in tomographic reconstruction, which set new standards for PET imaging that stand to this day. The innovative compact analog and digital readout, combined with the user-friendly software environment, delivered the breakthrough that allowed the field of small-animal PET to take off.

Functional Committees Continued from PAGE 5

In 2002, Roger founded Advanced Molecular Imaging (AMI) Inc. with two of his former students to commercialize the technological developments and breakthroughs developed in his laboratory under the LabPET trademark, such as the first commercial APD-based scanner. In 2007, AMI Inc. merged with Gamma Medica Inc., whose preclinical products line, including LabPET, has been commercialized worldwide by GE Healthcare. The LabPET line of products was upgraded continuously as soon as better components, such as better crystals or better APDs, appeared on the market, and was one of the first to replace discrete electronics components with ASICs.

Today, Roger's group is working at the forefront of developing new technologies, chiefly in merging PET with spectral CT imaging, and in the quest for "Time-of-Flight PET," the next frontier. The goal is to achieve timing resolutions well below 100 ps, which will allow large gains in sensitivity (or an equivalent reduction of the applied dose), and could even eliminate the image reconstruction stage in some applications.

Over the past 25 years, Roger has built an impressive network of scientific collaborations at the local, national and international level and continues to pursue R&D endeavors with industrial partners and other laboratories. He has educated and trained a large number of scientists who have meanwhile become leaders in the field in their own right. Virtually every year, at least one of his students receives a student or similar award for their outstanding contributions to the field of medical imaging. They follow the footsteps of their mentor, who was awarded recognitions and honors in every one of the last ten years, including the 2013 Lionel-Boulet Scientific Award, which is the highest distinction of the Government of Quebec for scientific research and industrial development, and the 2009 J.-Armand-Bombardier Award for technology innovation in medical imaging.

Please join us in congratulating Roger once more for receiving the well-deserved CANPS award 2016.

Citation: *For contributions of real time techniques in the field of Positron Emission Tomography.*

FUSION TECHNOLOGY AWARD

The Fusion Technology Standing Committee (FTSC) is pleased to announce that Dr. Wayne Meier is the recipient of the 2016 Fusion Technology Award, to be presented at the upcoming Symposium on

Fusion Engineering (SOFE), being held in Shanghai, China, June 4th–8th, 2017.



Wayne Meier
2016 Fusion Technology Award Recipient

The award cites Wayne's outstanding record of accomplishment and leadership in advancing the science, technology and integrated assessment of Inertial Fusion Energy power plants, as well as his distinguished service to the fusion community through the IEEE NPSS, the American Nuclear Society, and other important technical forums on fusion science and technology.

Wayne received his Ph.D. in Nuclear Engineering (emphasis on fusion) from University of California, Berkeley, in 1984. His career has been dedicated to the advancement of fusion energy, and he has authored/co-authored over 150 technical publications primarily in the field of inertial confinement fusion. Prior to his recent retirement (9/16), he served as Deputy Program Leader of the Fusion Energy Sciences Program (FESP), as well as Associate Program Leader, Fusion Materials and Technology, at Lawrence Livermore National Laboratory.



Charles Neumeyer
FTSC Chair

In addition to Wayne's technical achievements, his enduring commitment to the IEEE NPSS is noteworthy. He served on the FTSC for a decade, on the organizing committees of several SOFE conferences, and as the General Chair of the very successful 25th SOFE held in San Francisco in 2013.

The FTSC is very pleased to recognize Wayne's achievements that truly exemplify the spirit of the award and the mission of the FTSC.

The FTSC awards <http://ieee-npss.org/technical-committees/fusion-technology/> are presented at each biennial SOFE, one for each calendar year of the two-year cycle with the first year corresponding to the year between SOFE conferences and the second year corresponding to the year of the SOFE conference at which the presentation is made. The call for nominations for the 2017 award will be issued on January 1st, 2017 and the nomination period will close on February 15th.

Charles Neumeyer, Chair of the Fusion Technology Standing Committee, can be reached by E-mail at Neumeyer@pppl.gov.

2016 IEEE/NPSS RADIATION EFFECTS AWARD

Jean-Luc Leray, CEA, received the 2016 IEEE/NPSS Radiation Effects Award

Throughout his technical career, within the French Atomic and Alternative Energies Commission labs (CEA), Jean-Luc Leray has been working with government, industry and university laboratories to develop an understanding of the effects of the nuclear and space radiation environment. During the nineteen eighties and nineties, this application-oriented work led to the development of radiation-tolerant, radiation-hard, reliable devices and circuits based on early silicon on sapphire (SOS) and then submicrometer Silicon-on-Insulator (SOI) technologies.

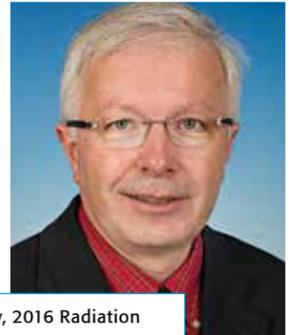
One of the several versions of SOI developed through industry and laboratory collaboration was used to build the core detector of the Atlas detector of the Large Hadron Collider (LHC) at CERN near the target of the collider where the showers of particle emerge (i.e., the tracker instrument). The radiation levels encountered here were unprecedented. Both his theoretical physics analyses and experimental solutions that allow proper design of hardened circuits led to the award to Jean-Luc of a national grand prize for electronics "General FERRIE" for radiation hardening of microelectronics technologies (1994). Some results of these developments, in the field of basic mechanisms and simulation of total ionizing dose effects in microelectronic structures (1D, 2D, 3D) are mentioned in the IEEE NSREC Short Course in 1997 and subsequent IEEE *Transactions on Nuclear Science* papers presented by the team. Outside the radiation-specialized applications, after these first large-scale demonstrations of reliability, the SOI technologies

gained larger interest. They later reached the wider market of low power as well as high-performance consumer and computing products, and entered into the decananometer nodes.

Transnationally, Jean-Luc and his team at CEA were instrumental in fostering the links between the European international RADECS community (Radiation Effects in Electronic Components and Systems) and the IEEE (the NSREC, the Radiation Effects international Community). He was the technical chair of the second international RADECS conference (1993) where the international participation increased and he chaired the 2007 conference in Deauville. He founded the French NPSS Chapter in the Section of the IEEE in 2001 and was twice elected Section Vice-president. In 2008, he was elected chair of the Transnational Committee of the NPSS AdCom, and since then, he especially strives at promoting European Membership and Student Section and Chapter creation.

At the CEA, he was named a Research Director in 2003, for leadership of research teams and projects and for a time he served as an Advisor of Technologies at the headquarters for Nanoelectronics, IT and HPC. Jean-Luc has contributed to over 100 peer-reviewed publications and over 200 proceedings and seminars. Since the 1980s he has regularly taught experimental nuclear physics, micro-nanoelectronics and radiation effects in several universities and institutions at the graduate level and continuing education courses. He is now active in the radiation compatibility of electronic systems for ITER, the international fusion reactor being built in France, with special attention considering the effects of single neutron interaction.

Citation: *For contributions to the understanding of basic mechanisms of radiation effects in microelectronic devices, and to the development of radiation-hardened SOI technologies in Europe.*



Jean-Luc Leray, 2016 Radiation Effects Award Recipient

Jean-Luc Leray can be reached by E-mail at Jlorange33@orange.fr

Liaison Reports



Edl Schamiloglu
NPSS Liaison to EAB

EDUCATIONAL ACTIVITIES BOARD (EAB) LIAISON

EAB's Core Purpose is "To be a leader in science, engineering, and technology education, to be a difference-maker in career-long learning for practitioners, to be a global catalyst for innovation, and to foster public understanding and appreciation of technology."

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EPICS IN IEEE—PRIORITIZING FOR THE FUTURE

This past Spring the members of the EPICS in IEEE committee and the EPICS in IEEE Working Group met during the 2016 EAB Mini-Series. Reports were given by the Public Relations firm supporting EPICS in IEEE and by the IEEE Foundation. Also during the meeting, representatives of IEEE SIGHT (Special Interest Group on Humanitarian Technology) gave

a brief summary of the relationship between SIGHT and EPICS in IEEE.

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UNIVERSITY PROGRAMS PARTNERSHIP

The University Resources Committee (URC) met at the EAB Mini-Series in the spring to conduct a MoSCoW (Must; Should; Could or Won't) assessment of its current product portfolio.

In order to conduct the MoSCoW, the URC was joined by members from the Faculty and Departments Committee (FDC), the Curricula and Pedagogy Committee (CPC), the Student Educational Resources Committee (SERC), and the Committee on Global Accreditation Activities (CGAA). Also participating in the assessment were representatives from the Committee on Engineering Accreditation Activities (CEAA) and the Committee on Engineering Technology Accreditation Activities (CETAA).

Once the initial reviews and assessments were completed, all of the subcommittee members joined the URC as a whole to discuss and rank the entire portfolio. This was conducted as a facilitated

session and included members specifically assigned as "Critics" and "Observers" in order to improve and focus the discussions. After difficult discussions, the URC submitted the following list of ranked programs to the EAB:

- » ABET Accreditation (Must)
- » Global Accreditation (Must)
- » IEEE Academic (Must)
- » Accreditation.org (Should)
- » Early Career Faculty Development (Should)
- » Real World Engineering Projects (Should)
- » Advanced Learning Workshop (Should)

EAB WEBSITE

You can follow EAB activities at http://www.ieee.org/education_careers/index.html.

Edl Schamiloglu, EAB liaison, can be reached by E-mail at edls@unm.edu.

BUT, TO WHAT END?

There is no truth, only progress

Karl Pepper

ENJOY YOURSELF

Pessimism, once you get used to it, is just as agreeable as optimism.

Arnold Bennett

A Note From IEEE Smart Village

LIGHT AND EDUCATION COME TO MADAN, PAPUA NEW GUINEA



Olga Anderson,
Secretary IEEE Smart Village Education Committee

In a three-stage project expanding to 40,000 people in the Waghi valley, a Sunblazer3 at every school will allow children to stream schoolbooks and educational videos from a local content server over a high-speed wireless network connecting the entire community. Teachers will receive recurrence training and build WordPress sites to share lesson plans and ideas. Preventative healthcare and water/sanitation/hygiene curricula will be rigorously implemented in each school to fight diseases and encourage healthy habits. In addition, each village is developing plans for clean drinking water systems and for effective sanitation systems.

For the Madan Medical Clinic (which currently serves 10,000 patient visits, provides 5,000 vaccinations, and delivers hundreds of healthy babies annually) the IEEE Smart Village project means more saved lives: nighttime emergency care, electric medical tools, vaccine refrigeration, and a remote diagnostics video link to the regional Nazarene hospital.

The community centers can now become efficient hubs of empowerment training in entrepreneurship, adult literacy, financial management, vocational skills, and gender equality. In the evening, LED lights shining through the windows of the community centers will draw together the people of Madan to learn, innovate, grow strong, and build their dreams.

In the highlands of Papua New Guinea, 4,000 people of the Madan village talk like a big family. This time, a bright future was on everybody's minds: 35 schools, three community centers, and the medical clinic are receiving light, power, and digital education.

It is not easy to dream about academic excellence or entrepreneurial success in a country where 97% of the population have no internet, 90% lack reliable electricity, and every 25th child dies of waterborne diseases. Most schools around Madan currently have no books, no desks, no drinking water, and no light, but plenty of hope thanks to the collaborative effort of IEEE Smart Village, The Rotary Foundation, and Transform Int'l.



Children in a local school with no books, no desks, no blackboard, but plenty of hope.



Vaccinations are currently only available during the daytime



Women studying together in the Madan Community Center.

MUTUAL UNDERSTANDING

We were in agreement that the danger of nuclear war was great, but Teller meant that the danger was great if the U.S. government should listen to me, and I meant the danger was great if the U.S. government should listen to him.

Leo Szilard

THINK ABOUT IT

Once any treatment is shown beyond doubt to be effective it ceases to be 'alternative' and becomes just like any other part of medical knowledge. That means that 'alternative medicine' must consist entirely of unproven treatments.

David Colquhoun

Articles

On The Way to a Unified Communication Framework

Modern data-acquisition systems in particle physics put high demands on data throughput and tight constraints on trigger accuracy and timing resolution. Several CERN experiments, e.g., ATLAS, COMPASS, CMS, or LHCb [1] implement their DAQ systems with separate high-speed links for data, trigger distribution and control. The underlying topology of separate links connecting the front-end to the FPGA stages and the computer farms at the back-end is the same. This split topology already raises the question why there is no unified communication interface that can handle data, trigger, and control via a single link. Such a channel would reduce the

amount of separate links, simplify the DAQ topology, reduce the number of error sources, and reduce development time.

For other types of experiments, the need for one single link handling data, trigger and control might arise from the experiment design itself. This is the case for the neutron lifetime experiment PENeLOPE, which is under construction at the Technische Universität München in Garching [2]. PENeLOPE uses a multi-channel particle detector on a high electrical potential inside a vacuum chamber. To reduce the number of high-voltage feedthroughs

it uses a single optical link. These requirements triggered the development of the Unified Communication Framework (UCF).

The UCF is based on the Synchronization Of Data Acquisition (SODA) time-distribution system [3]. The SODA implements a 1:n topology using a bidirectional optical link. Its extension from a pure time-distribution system towards a framework that is capable of handling multiple data streams and all kinds of DAQ topologies in a bidirectional manner lead to the UCF. In UCF, data, slow-control, trigger, and timing information share a single link. Figure 1 shows the star-like, point-to-point and hybrid topologies supported by the framework. In each of the architectures at least one connected party acts as the master and the other parties as slaves.

The star-like topology can be used for experiments with low data rates, time-distribution systems, and trigger-distribution systems with bidirectional link. The master broadcasts information to all slaves while the slaves share access in a Round-Robin manner.

Experiments with high data rates can use the point-to-point topology connecting several masters on one FPGA with slaves on other FPGAs. The number of possible connections is only limited by FPGA resources.

The UCF allows up to 64 different communication channels that can be divided into three classes with different transmission priorities. The first class guarantees a deterministic and fixed latency. The second class is prioritized over the third and allows transmissions with small delay. Timing and trigger messages belong to the first class whereas the

Articles Continued from PAGE 7



Dominic Gaisbauer
CANPS Student Paper Award recipient

slow-control messages should be connected to the second class in order to avoid time-outs due to high traffic on third-class channels.

The UCF uses a low-level transport layer protocol that handles communication and initialization of the connection parties. It uses an 8b/10b encoding scheme and some 10b K-characters for transmission control and synchronization. The latter is achieved by sending a unique sequence of two K-characters during the initialization phase, allowing the slaves to lock onto a fixed phase of the recovered clock. Together with a build-in priority handling the UCF can guarantee a determined latency for one communication channel. The developed protocol automatically recognizes a loss of synchronization or a communication failure and re-initializes the connection.

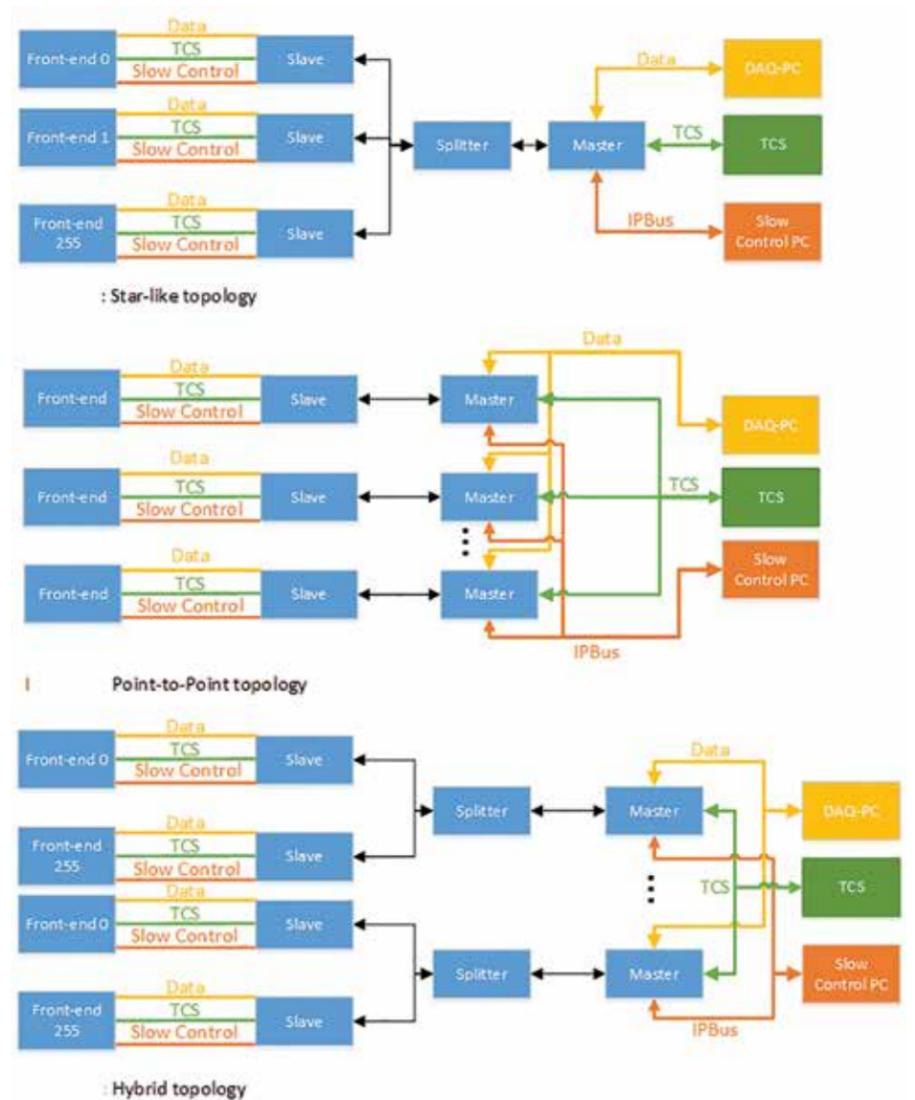
To easily integrate the framework into the user's firmware, a single VHDL package file is used to configure UCF. In this file all important parameters — e.g. number of communication channels, topology of the network, and link speeds are defined. The different communication channels of the UCF can be addressed by the standardized ARM AMBA AXI interface [4], allowing easy integration into existing firmware and communication with other IP cores.

CONCLUSION

The Unified Communication Framework provides up to 64 communication channels via a single optical fiber and various user-definable link speeds. In either topology — 1:n or multiple 1:1 — the framework provides a fixed latency transmission for one of the 64 communication channels. Currently the UCF is being integrated into several experiments in particle physics, including PENeLOPE, BELLE II's pixel detector [5], NA64, and COMPASS.

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LOVE IS BLIND

In a country where values are collapsing, patriotism becomes the handmaiden to totalitarianism. The country becomes the religion. We are asked to live in a state of religious fervor: Love America! Love it because America has become a substitute for religion. But to love your country indiscriminately means that critical distinctions begin to go. And democracy depends upon these distinctions.

Norman Mailer

2017 Student Challenge



The IEEE Council on RFID (CRFID) is new to IEEE Technical Activities and to IEEE Division IV, of which the NPS Society is a member. As a council, we count 16 IEEE technical societies as members. To engage and interest undergraduates, graduate students, and their advisors, we are offering a competition that addresses real-world problems and is:

- » Open to any accredited, degree-program educational institution
- » Composed of teams with at least one IEEE student member and at least one advisor who is an IEEE member

2017 CHALLENGE: SMART CITIES

The 2017 challenge focuses on the use of radio frequency identification RFID in Smart Cities.

Teams will be rated on how they plan and evaluate a solution that incorporates RFID technology and systems. Teams are asked to prepare as if responding to a request for proposal (RFP).

- » The team will choose a city and a problem it faces that can be addressed by a smart city solution (e.g., traffic flow, mass transit, infrastructure support, revenue collections, parks management, etc.)

- » The team will identify a solution that includes the use of RFID.

For support from the RAIN Alliance, passive UHF RFID must be included in the solution.

- » The team will identify the steps needed to implement the solution.

- » Submissions must be an 8-10-page summary, which includes:

- Problem statement
- Proposed solution
- Differentiator (why this solution vs. others)
- Resource summary (Personnel and equipment)
- Team summary – bios, function

- » Optional bonus points for:

- A paper prepared for a CRFID peer-reviewed conference proceedings.
- YouTube video or privately available video/slide show.

- Partnering with an Industry Advisor from RAIN Alliance

- Partnering with an Industry Advisor

- Use of other resources, for example:

IEEE's Smart Cities initiative has a repository of publications

The US federal government recently announced it is committing over \$80 million—led by NSF with a \$60M commitment over two years—toward the Smart Cities Initiative

Equipment sponsored by a RAIN Alliance member

DEADLINE: JANUARY 31, 2017

Judges from IEEE CRFID and the RAIN Alliance will select the top three teams to present at the

IEEE RFID 2017 conference at the RFID Journal Live! event in Phoenix, Arizona in May 2017.

Up to \$5,000 (USD) student travel support is available from IEEE CRFID and the RAIN Alliance. Alliance members will prep presenters whose solution uses passive UHF.

For more information, please contact Emily Sopensky, President, Council on RFID. e.sopensky@ieee.org

PUBLIC ACCOUNTING

My problem lies in reconciling my gross habits with my new income.

Errol Flynn

The Mobile Wallet Factor: How Retailers Should Navigate the New Era of Chip Card Technology



By Ken Kunz

This month marks the one-year anniversary of the EMV (Europay, MasterCard and Visa) liability shift, which transferred the responsibility for fraudulent credit/debit card transactions from card companies to merchants that do not use EMV chip-enabled terminals.

There have certainly been happier anniversaries. This 12-month span has been marked by confusion and frustration. The rollout of chip-and-pin cards was not simultaneous, leaving many consumers without the right cards. Even with chip-and-pin cards, however, the payment experience has become convoluted. Attempts to insert the card into an EMV terminal slot are often stymied, and you end up having to swipe the card like before.

The authentication process also seems to take noticeably longer. In fact, if a consumer uses their credit card four times a day, they will spend five-and-a-half hours per year waiting for EMV transactions to go through.

Needless to say, the transition has not gone smoothly. This is not unexpected, as the U.S. is the largest card market to migrate to EMV technology. At the heart of this conflict are retailers, many of which have yet to upgrade despite the shift being announced five years ago in 2011. In fact, it is estimated that it will take until the end of 2017 before 90 percent of retailers are EMV ready.

Retailers can't take all the blame, however. A recent survey found that among retailers that had upgraded their systems, most have been waiting for more than six months to achieve certification from credit card companies. The entire process is time-consuming: The National Retail Federation reports the average retailer takes 19 months to get EMV fully operational in their organization.

This, combined with the costs of upgrading (average costs for EMV-compliant card terminals are \$200-\$500, which adds up quickly for large retailers), has left many retailers dragging their feet. It seems at least in the short term, many of them are willing to bear the brunt of fraudulent transactions than pull the trigger on this expenditure.

Many practitioners in the mobile industry are eager for retailers to fully embrace EMV, as it will significantly expand the number of terminals where contactless and Near Field Communication (NFC) mobile payments can be processed, in addition to chip-and-pin cards. Experts expect it to lay the groundwork for a payments revolution that will see more consumers in the U.S. pay with their

smartphones than cards or cash by 2020. These will largely be processed using mobile wallets like Apple Wallet, Android Pay and Samsung Pay, which increasingly are coming pre-installed on smartphones and smartwatches.

Over the past few years, we have seen a number of market forces driving the mobile wallet evolution. These include robust investments from Apple and Google, rapid consumer adoption of non-payment mobile wallet features like boarding passes and the runaway success of the Starbucks' mobile wallet within its app. But there has been a missing link – the limitations to scan smartphones at the cash register. If stores don't have the technology to accept mobile payments, mobile wallets can never truly "take off."

At the onset of mobile wallets, they faced a chicken-and-egg problem. Retailers had little incentive to upgrade their POS systems to accept mobile payments because there were few phones with NFC chips installed. Smartphone makers, fully aware of the small footprint of NFC-supported systems, failed to see a reason to make space for the chip in their devices.

Now that NFC chips are a staple in smartphones and the EMV transition has incentivized retailers to toe the line, mobile wallets are well on their way to becoming powerful commerce platforms. Apple and Google have bolstered their mobile wallets and now both apps are capable of processing payment and loyalty information simultaneously. Adding offers to that mix is on the horizon.

Smart retail CIOs see where the puck is going and are upgrading to POS terminals that can support contactless loyalty transfer, in addition to mobile payments. Verifone and Ingenico are a few POS providers that meet these criteria. In cases where terminal upgrades have already been made, the provider should be able to add this functionality via an over-the-air software update.

Selecting a system with these capabilities offers other advantages beyond reducing fraud liability and delivering a better payment experience. At Vibes, we help loyalty teams and marketers at large retailers leverage mobile wallet for marketing purposes. By mobilizing their loyalty programs and offers in Apple Wallet and Android Pay, retailers can not only allow shoppers to get rid of plastic loyalty cards and print coupons, but also achieve business outcomes, such as driving in-store foot traffic, increasing basket size and improving loyalty.

Apple and Google have both indicated that the ultimate vision for checkout is a single tap that

integrates the trifecta of payment, loyalty and offer data into one seamless experience. This vision is rapidly approaching reality, and retailers that orient the next generation of their POS infrastructure around mobile wallets will realize an even greater return on their investments.

Ken Kunz is the VP of Technology at Vibes, a mobile marketing leader. Ken leads all aspects of Vibes' technology organization, including engineering, infrastructure, product and user experience.

News from the IEEE Foundation

The Board of the IEEE Foundation met in Piscataway, NJ on November 9th and 10th. A highlight of the meeting was the presentation of the IEEE Eric Herz Outstanding Staff Award to Karen A. Galuchie, the Foundation's Executive Director. With the donation of the award's honorarium to the Foundation, Karen also joined the ranks of the Foundation's Heritage Circle. And with this gift she challenged IEEE staff to donate on November 29th, Giving Day, to match her gift.

IEEE Smart Village volunteers also thank Karen for her support of this Signature Program of the Foundation.

Citation: For exceptional staff leadership and for support and service to IEEE volunteers in achieving the philanthropic objectives of the IEEE and the IEEE Foundation.



Leah Jamieson, IEEE Foundation President, presents Karen Galuchie with Heritage Circle membership certificate.

Conference Report

Continued from PAGE 3

Photo Highlights from the 2016 NSS/MIC/RTSD



Thomas Beyer, Paul Marsden, David W. Townsend, the Edward J. Hoffman Medical Imaging Scientist Award recipient, Dimitris Visvikis, and Glenn Wells.

Photo by Ralf Engels



Cherry receives the IEEE Maria Sklodowska-Curie award from Bill Moses

Photo by Ralf Engels



Chiara Guazzoni, Christopher Damerell, the IEEE Glenn F. Knoll Radiation Instrumentation Outstanding Achievement Award recipient, Susanne Kuehn, and Eckhard Elsen.

Photo by Ralf Engels



Eckhart Elsen, NSS Program Chair, left, and Susanne Kuehn NSS Deputy Program Chair, right, with student paper award recipients.

Photo by Ralf Engels

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Publicity releases for forthcoming meetings, items of interest from local chapters, committee reports, announcements, awards, or other materials requiring society publicity or relevant to NPSS should be submitted to the Newsletter Editor by January 5th, 2017 for publication in the March 2017 Newsletter.

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

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

