



Your RRSD Leadership Team

We all thank you for being a member of the ANS RRSD and we look forward to meeting and working with you. Please don't hesitate to reach out to us with suggestions or if you would like to get involved

Officers

Mitchell W. Pryor - Chair
Leonel E. Lagos - Vice Chair
Brian E. O'Neal - Secretary
Steven W. Shaw - Treasurer
Chris P. Eason - Past Chair

Executive Committee

(Terms Expiring)

Luke T. Reid	(2018)
Young Soo Park	(2018)
Kimberly Monti	(2019)
Stephen L. Canfield	(2019)
Ji Sup Yoon	(2019)
Shikha Prasad	(2019)
Kevin E. Cooper	(2020)
Dale A. Dalma	(2020)
Phillip D. Heermann	(2020)

Visit our Website

rrsd.ans.org

Contact us

rrsd.ans.org/contact-us

A Message from the Chair

Welcome to the 2017 Summer Newsletter.

It has been a busy year. Thanks to everyone who participated in last summer's topical in Pittsburg, PA. The event was a big success and Pittsburg was a great venue given the strong presence of both the nuclear and robotics industry in the area. Thanks to everyone who helped make it happen. The highlight for me was the robotics pub crawl where approximately 50 RRSD attendees walked the streets of Pittsburg to visit some great robotics companies followed by some well-deserved thirst quenching.

That was just start of major activities related to robotics in nuclear environments. With increased interest in robotics from DOE, abroad, and in both the commercial and D&D industries, the opportunities for our membership to get together and exchange ideas has also increased. Waste Management held multiple panels and paper sessions on robotics at their 2017 symposium as well as dedicated a portion of the exhibit hall for the demonstration of a wide range of robotics technologies. Florida International University held a two day workshop (TechNeeds) that was also informative and well-attended. The schedule is again packed in the upcoming year starting with a Forum on robotics and automation in hazardous environments in conjunction with IEEE/IROS. It is September 26th in Vancouver, CA. The upcoming Waste Management Symposium, which has traditionally used a country to inspire an annual theme, has chosen robotics as its theme for 2018.

The increased interest and resulting activities are a net positive for the broader robotics and remote systems community. The Executive Committee has committed to raising awareness of these and other opportunities for our members, as well as using these collaborative opportunities to bring broader awareness to our own activities like our topical meetings.

I hope to do more than just increase the number of attendees at a conference. This year provides an opportunity to bring together the best that all these institutions offer. ANS RRSD has many members from within the DOE Complex and similar institutions world-wide. In fact, several EC members will be visiting Korea in November

to further our collaborations with Korean researchers and institutions. This provides a basis for expanding our understanding of the requirements for robotics and remote systems, a full appreciation for what it takes to deploy them, and an awareness of the impact of emerging *nuclear* technologies and applications. Waste Management Symposium enjoys broad industry support, and IEEE is a stalwart in the academic community with an excellent peer review processes and accessible publications. These are general not absolute strengths (i.e. the RRSD Chair is a university employee after all), but they are strengths. Strengths that can be combined.

One of the critical lessons we learn from our collective past is the negative impact of stove-piping. Thus, we hope use these opportunities to better integrate the greater RRSD community for the betterment everyone. It is the current intention of ANS to host its next topical in 2019 to avoid a glut in 2018 and maintain our communities momentum in the long term. Discussions are ongoing to do hold it in conjunction with IEEE. Such an event has the potential to bring more technology to bear on our applications, and give those who are developing emerging technologies, a better appreciation of the application space itself.

Thank you for your time and I hope to see you at one or all of these events.

Regards,

Mitch Pryor

Chair, RRSD



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PAST EVENTS

There has been a notable uptick in the interest in robotics and remote systems for nuclear applications. This has created a broader and more diverse set of participants (both individuals and societies) in the area of robotics in hazardous environments. In the last year alone, there were multiple events starting with our very successful topical in Pittsburgh in the summer of 2016.

2017 WM Symposia

Robotics was a focused topic of interest at the 2017 Waste Management Symposia (Phoenix, AZ, March 2017). Robotics programs in support of Department of Energy missions were featured in a record number of presentations in technical sessions and exhibits during the WM symposia. Other featured sessions were related to Japan's activi-

ties on cleanup and waste management at Fukushima. Also during the symposia, a joint meeting was held between the ANS RRSD and the IEEE Robotics and Automation community to discuss future collaboration. This meeting was organized by DOE-EM and Mitch Pryor and William Hamel.

2017 TechNeeds: *Robots, Sensors & Humans*

– Benefits & Challenges of the Implementation of Robotic Systems in Hazardous Environments

The inaugural TechNeeds seminar brought together robotic experts from federal agencies, national research laboratories, industry and academia to address the integration of robotic systems into hazardous work environments and how they can be used to assist and support the workforce to accomplish high priority/high risk tasks. Titled, “Robots, Sensors & Humans – Benefits & Challenges of the Imple-

mentation of Robotic Systems in Hazardous Environments,” the seminar was held at the Modesto A. Maidique campus of Florida International University (FIU) in Miami, FL, on May 3 and 4, 2017. ANS' RRSD was represented by Mitch Pryor, Young Soo Park and Leonel Lagos.

(<https://techneeds.eng.fiu.edu>)



ROS-G / EXO-G Workshop

U.S. Department of Energy (DOE), Office of Environmental Management (EM) hosted two technical interchange meetings, namely ROS-G and Exo-G, to initiate cooperation among robotics community, industry and government department and agencies on the application of key emerging robotics technologies in the industrial and government sponsored activities. ANS' RRSD was represented by Leonel Lagos, Philip Heermann, Mark Noakes, and Young Soo Park.

The ROS-G meeting was held on June 26-27, 2017, at the Argonne National Laboratory (ANL) D.C. Office in Washington D.C. The federal robotics community has been engaged in discussions on the concept of a “ROS-Government” (ROS-G) initiative. There was general agreement on the potential benefits of synergizing federal agency activities and leveraging projects on ROS-M (military), ROS-I (industrial), ROS-SE (security), ROS-AG (agriculture), ROS-DOE,

and other ROS applications. Federal agencies recognized the value of ROS (robot operating system) middleware, particularly as attempts are made to standardize robotic platforms while still preserving ROS' open architecture.

The EXO-G meeting was held on June 28-29, 2017, at Crystal Gateway Marriott, Arlington, VA. The purpose of this meeting was to engage the robotics community on industrial applications of human-wearable and human-attachable robotic devices to enable and proliferate use among the various occupational groups. This meeting was an ongoing collaboration among several other U.S. federal government executive departments and independent agencies including NIST, HIOSH, NSRDEC. Speakers from government agencies and industries have shared their development, and provided forums for open discussions and technology exchanges among the participants.

UPCOMING EVENTS

2017 IROS Forum on ‘The Future of Robotics and Automation in Nuclear Facilities and Environments’

The objective of this forum is to facilitate exchange between researchers, users, and decision makers of robotics and automation technologies in nuclear operations and facilities.

As a cooperative effort between the ANS RRSD and the IEEE Robotics and Automation Society, it will include presentations and discussions about the challenges of remote operations, with particular interests in clean-up of legacy nuclear facilities in the world, and the recovery operations at the Fukushima Daiichi site.

This full-day forum offers opportunities for researchers and end-users to present results related to emerging technologies, deployments of robotic and remote systems, and developing a better understanding of the requirements for performing work in hazardous environments. Specific topics of interest are:

- Updates on key R&A technologies applicable to Nuclear Facilities from both academia and industry.

- Presentations and discussions regarding recent waste site clean-up uses of, and results with, R&A from around the world.
- Presentations overviews of the challenges and requirements for completing work remotely in specific application spaces.
- Technologies that enable robotic and autonomous systems to be successfully deployed and utilized by on-site personnel.
- Presentations on existing, or emerging technologies, from other extreme environments relevant to the nuclear domain.

Vancouver will be a beautiful fall venue and RRSD members should attend the forum. See details about IROS 2017 at <http://www.iros2017.org>. You can contact Bill Hamel (whamel@utk.edu) or Mitch Pryor (mpryor@gmail.com) for more information. It's important for us to have strong RRSD participation, so please consider submitting a presentation abstract (.pdf) at whamel@utk.edu by September 5, 2017.

2017 ANS Winter Annual Meeting - DOE-EM Robotics Roadmap

During the 2017 ANS Winter Annual Meeting, Rodrigo Rimando, Director of Office of Technology Development, DOE -EM, will announce the DOE-EM Robotics Roadmap. Also technical sessions have been proposed on the robotics and remote

ISOFIC 2017

International Symposium on Future I&C for Nuclear Power Plants will be held on November 26-30, 2017 in Kyeongju, South Korea. Representatives from the ANS RRSD are expected to participate in joint technical sessions. During the conference, joint meeting will be held between the US-Korean RRSD representatives for potential future collaborations.

2018 WMSYM – Robotics Focus

Join us in Phoenix, AZ, March 18-22, 2018 for the 44th annual Waste Management Symposia, the World's Largest Radioactive Waste and Material Conference. The 2018 WM2018 will explore the theme **Nuclear and Industrial Robotics, Remote Systems and Emerging Technologies** as a common thread across all 10 of the Conference subject matter tracks throughout the conference week, as participants from over 30 countries gather to discuss effective solutions to the management and disposition of radioactive wastes, and the decommissioning of nuclear facilities. WM2018 will include presentations describing research, development and operational experiences over the complete spectrum of nuclear waste activities. These presentations are complemented by a large exhibition showcasing a wide variety of products and services related to the industry, the US DOE and other government agencies. The exhibition will also showcase the 2018 theme with a Robotics Pavilion showcasing an extensive display of the latest robotic technology from government and industry leaders with floor and table-top demonstrations.

The Nuclear and Industrial Robotics, Remote Systems and Emerging Technologies theme will focus on all aspects of the use of robotics, remote systems, sensing, tools and control systems used in industrial and nuclear industry environments, including needs, problem statements, research and development and applied technology solutions. Presentations will discuss technology maturation, utilization, testing and verification, best practices, lessons learned, knowledge management and trends in robotics and remote systems,

applications, facilities, use in emergency preparedness or response and recovery actions and the ability to withstand exposure to radioactive contamination or ionizing radiation. This topic will organize various oral sessions and related Topics, such as: Role of Robotics in the Management of HLW, SNF/UNF and Long-lived Alpha/TRU; Remote System Handling and Robotics for Commercial Nuclear Power Plants; Application of Innovative D&D Technologies Including Robotics and Remote Technologies.

Don't miss the opportunity to exchange ideas, technical information and solutions with 2,000 nuclear waste industry delegates from around the world. Please visit our website, www.wmsym.org, for more information and to register,

Upcoming MeeSngs

2017 IROS Forum (09/26/17, Vancouver, Canada)

2017 ANS Winter Annual MeeSng (10/29-11/2/2017, Washington DC)

ISOFIC 2017 (11/26-30, South Korea)

2018 WMSYM (3/18/2019, Phoenix, AZ)

2018 TechNeeds (TBD, Miami, FL)

2019 ANS/IEEE Joint meeSng on Robotics in Hazardous Environments (*tentative*, TBD, Albuquerque, NM)

Welcome to Our New Executive Officers!



Kevin E. Cooper
(Indiana River
State College)



Philip D. Heermann
(Sandia National Lab)



Michael J. Dalmaso
(Savana River
National Lab)

Outgoing members of the Executive Committee

Daren Cato (EC Member)
William R. Hamel (EC Member)
Jessica S. Stiles (Student Support Chair)

Thank you for your service!

Collecting Nominations and Elections

Chris Eason – Nominating Committee Chair

1 October, 2017: A slate of candidates must be identified by the Division Nomination Committee for the 2018 ballot.

2 November, 2017: Division Nominating Chair must report election slate to ANS HQ

31 December, 2017: All biographical information and candidate photos must be received by ANS HQ

Sample ballots sent to Nominating Committee Chair for approval

RRSD Mission

The Mission of the Robotics and Remote Systems Division is to promote the development and application of robotic and remote systems for hazardous environments for the purpose of reducing hazardous exposure to individuals, reducing environmental hazards and reducing the cost of performing work.