



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

- Leonel E. Lagos - Chair
- Brian E. O'Neal - Vice Chair
- Young Soo Park - Secretary
- Steven W. Shaw - Treasurer
- Mitchell W. Pryor - Ex-Officio

Executive Committee

[Terms Expiring]

- Stephen L. Canfield (2019)
- Ji Sup Yoon (2019)
- Shikha Prasad (2019)
- Kevin E. Cooper (2020)
- Michael Dalmaso (2020)
- Phillip D. Heermann (2020)
- James S. Tulenko [2021]
- Adams J. Carrol [2021]
- Corrie Ian Nichol [2021]

Visit our Website

rrsd.ans.org

Contact us

rrsd.ans.org/contact-us

A Message from the Chair

It has been a busy year. Thanks to everyone who participated in this summer's ANS annual meeting in Philadelphia, PA, and many other national and international meetings, workshops and conferences that promoted and advanced the RRSD mission.

Due to the worldwide need for the deactivation & decommissioning (D&D) of nuclear facilities, an interest in robotics technologies has increased in the US and abroad. The Department of Energy in the US, as well as government organizations in the UK, South Korea, Japan and many other countries, have increased investments in robotic technologies for D&D. Interest in robotic technologies has also increased among commercial nuclear power utility companies across the world. Due to this increased interest, opportunities for our membership to get together and exchanges ideas has also increased. In September 2017, the IEEE/IROS was conducted in Vancouver, CA. Also, in March 2018, the Waste Management Symposia (WMS) took place in Phoenix, AZ. This year WMS featured "robotics" as the central theme for the conference. This was the first time WMS featured a technology as the central theme for the conference. An entire section of the Exhibition Hall was dedicated to robotic technologies. The "Robotic Pavilion" allowed DOE national labs, industry, academia and other federal agencies to showcase their technologies for various applications, including nuclear robotics.

The increased interest and resulting activities are a net positive for the broader robotics and remote systems community. The Executive Committee (EC) 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.

Currently, ANS RRSD has many members

from within the DOE Complex and similar institutions worldwide. In fact, several EC members visited South Korea in November 2017 and a couple members returned to South Korea in August 2018 in an effort



to further expand collaborations with South 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 and accessible publications.

One of the critical lessons we learn from our collective past is the negative impact of stove-piping. Thus, we hope to use these opportunities to better integrate the greater RRSD community for the betterment of everyone. ANS RRSD is joining forces with IEEE to conduct an international robotic topical in 2020. These two groups conducted a joint meeting at the end of WMS18 that was attended by representatives from the UK, South Korea, and Japan as well as representatives from DOE national labs and academia.

Regards,

Leonel E. Lagos

In this Issue

Past Events **P.2,3**

Upcoming Events **P.4**

Nominations and Elections **P.5**

DOE-EM Robotics Exhibition at 2018 WM Symposia

The Waste Management 2018 (WM2018) conference held this past March featured the development and application of robotics and sensing to overcome radioactive waste management challenges. This rapidly evolving technological area was showcased through topical sessions and extensive displays of equipment from industry, government and academia exhibitors, which were demonstrated on the show floor. There were a total of 98 papers, 138 presentations, and 15 posters among 27 separate robotics sessions. The robotics sessions represented over 18% of the conference papers and 17% of the panels. The attendance at the sessions averaged 37 with a high of 85 during session 003, “US DOE-EM Robotics,” during which the stage was set for the many papers, panel presentations and post-

ers. These statistics set a notable precedence for the first-time theme at WM2018. The Robotic Pavilion at the symposia showcased 30 different robotic platforms and tools by 20 DOE national labs, universities, and other federal agencies to highlight the wide variety of robotic devices for the equally wide use-applications. The pavilion featured a four-section area that incorporated different surface-types and configurations for hands-on, live demonstrations of the robots’ capabilities. Five companies also exhibited their robotics products and capabilities during the conference. The overall value to the nuclear cleanup and radioactive waste management community at WM2018 was a significantly increased awareness and knowledge of robotics as work- and mission-enabling tools.



DOE-EM Robotics Roadmap

In FY17, a team was built to develop a roadmap to provide strategic direction to the Department of Energy’s Office of Environmental Management’s (DOE-EM) Science of Safety Initiative by establishing an actionable framework to infuse and use robotics, remote systems, and related technologies to lower occupational risks and exposure and enhance the productivity of workforce personnel. Site needs were surveyed, key technologies were identified, and a mapping of technologies to needs was developed. The resulting roadmap includes near-term deployments as well as near- and far-term research and

development tasks. An update of the roadmap was presented at the Waste Management Symposia 2018 during Panel Session 060. The panel was chaired by Mr. Kim Auclair, (KD Auclair & Associates LLC) and Mr. John Lee (US DOE EM). The panelists included Mr. Rodrigo Rimando (US DOE EM Office of Technology Development), Mr. Richard Voyles (Purdue University) and Mr. Jason Wheeler (Sandia National Laboratories). During this panel, the DOE-EM Roadmap was presented, and all team members were available to answer questions from the audience.

Surge in RRSD Related Activities in UK

Two ambitious RRSD related programs are about a year into their research after awards from the British Research Councils for Engineering and Physical Sciences (EPSRC) and the Natural Environment (NERC). The program's purpose is to develop and deploy robotics and artificial intelligence systems in extreme environments. Robotics and AI in Nuclear (RAIN), led by the University of Manchester, is a team of eight university and research lab participants whose overall objectives are to "lower costs within the nuclear industry, reduce timescales, reduce risk, improve safety, promote remote inspection and reduce the chances of human exposure to radiation and other hazards." The National Centre for Nuclear Robotics (NCCR) is

led by the University of Birmingham and includes 7 universities leading the way to deliver the significant advances necessary to address UK's 4.9 million tons of legacy waste as well as support future monitoring, maintenance and plant life extension tasks. Including consortiums addressing off-shore energy and space robotics, the UK invested £68M into research related to robotics and artificial intelligence in extreme environments. These efforts have enabled UK's researchers to reach out to the international communities, particularly in Japan, South Korea, and other EU partners, to collaboratively address the common problems facing each community in terms of safety, clean-up, and emergency response.



RRSD Collaboration Efforts with South Korea

There have been a series of efforts for collaboration between the South Korean RRSD community and the ANS RRSD. Last year, a number of US RRSD representatives visited South Korea per invitation by the RRSD division of the Korean Nuclear Society. Besides the conference attendance, it provided opportunities to assess potential collaboration areas and identify potential partners. Following up, a new action item was added at the US-ROK Joint Standing Committee on Nuclear Energy Cooperation (JSCNEC) to pursue further programmatic collaboration on R&RS for nuclear D&D. Subsequently, at the

RRSD executive committee meeting, follow-up actions were discussed. A suggestion was made for an international workshop on D&D and emergency response to invite experts in the R&RS and D&D community of the US and South Korea as well as other countries such as UK. Representatives from ANS RRSD, Leo Lagos and Young Soo Park, have visited South Korea to promote participation in this workshop as well as future collaboration. It was agreed by both the US and South Korean participants to jointly host the event and further the collaboration in D&D and ER robotics.



RRSD Executive Committee Meeting in Philadelphia

The ANS summer meeting was a great place to connect with our colleagues and catch up in the exciting work that is being conducted by our Executive Committee members. This was the last meeting conducted by our former chair (Dr. Mitch Pryor—University of Texas—Austin). Mitch will continue contributing to the EC in the capacity of Ex-Officio. Also, a plaque was presented to outgoing member, Mr. Luke Reid (Savannah River National Laboratory). RRSD would like to extend our appreciation to Mitch and Luke for all that they have done for RRSD throughout the years. In addition, three new members of the Executive Committee were welcomed to the group, including Jim Tulenko (University of Florida), Adam J. Carrol (Oak Ridge National Lab), and Corrie Ian Nichol (NuScale Power). During the meeting, discussions regarding the collaboration between IEEE and RRSD took place and the framework for this collaboration was established. Three potential host sites were identified and a

selection process was established. RRSD will continue to provide updates on this joint topical between IEEE and RRSD.

Other business included discussing the ANS Winter meeting in Orlando, FL, and the preparation of abstracts/papers to be submitted. The RRSD committee agreed to solicit the interest of our members for abstract/paper submissions and organize at least two sessions at the Winter meeting. Also, Mr. Gary Benda (WMS Deputy Managing Director) provided an update on the 2018 Waste Management Symposia (WMS) which included “robotics” as the central theme for the conference. Many RRSD members participated, presented and showcased their robotics technologies at WM18.

Finally, at the meeting, we also welcome the new RRSD officers that included Leonel E. Lagos (Chair), Brian E. O’Neal (Vice Chair), Young Soo Park (Secretary), and Steven W. Shaw (Treasurer).

Upcoming Meetings

2018 ANS Winter Annual Meeting (Nov 11 -15/2018, Orlando, FL)

2019 International Workshop on RRSD for D&D and Emergency Response (Feb 2019, Miami, FL)

2019 WMSYM (Mar 3-7/2019, Phoenix, AZ)

2020 IEEE International Conference on Robotics and Automation in Hazardous Environments (Jan 2020 *tentative*), Location (*TBD*))

Welcome to Our New Executive Officers!



James S. Tulenko
(University of
Florida)



Adam J. Carrol
(Oak Ridge
National Lab)



Corrie Ian Nichol
(NuScale Power)

Outgoing members of the Executive Committee

Luke T. Reid (EC Member)

Thank you for your service!

Collecting Nominations and Elections

The RRSD Nominations Committee is accepting nominations to join the RRSD Executive Committee in the 2019 election. The nomination committee must submit its slate of candidates to ANS in early October, 2018 so please send your personal interest or nominations to the chair of the election committee, Mitch Pryor (mpryor@utexas.edu) no later than September 20, 2018. The nomination committee strives to keep a balanced committee between academia, industry, and the national labs. Nominees must be in good standing with ANS and willing to actively support the division's mission to use robotics and remote systems to reduce the hazardous exposure of individuals, reduce environmental hazards, and reduce the cost of performing work in hazardous environments.

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

2 November, 2018: Division Nominating Chair must report election slate to ANS HQ

31 December, 2018: All biographical information and candidate photos must be received by ANS HQ

Sample ballots sent to Nominating Committee Chair for

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.