



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

Treasurer -

Mitchell W. Pryor - Ex-Officio

Executive Committee

[Terms Expiring]

Kevin E. Cooper (2020)

Michael Dalmaso (2020)

Phillip D. Heermann (2020)

James S. Tulenko [2021]

Adams J. Carrol [2021]

Corrie Ian Nichol [2021]

Joseph E. Kowalczyk [2022]

Jean R. Plummer [2022]

Vaibhav Sinha [2022]

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rrsd.ans.org

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A Message from the Chair

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

Robotics is more relevant than ever. The interest in robotics for nuclear decommissioning continues to expand across the globe. Countries such as the United Kingdom, Germany, South Korea, Japan, Ukraine are conducting research and development, as well as, deploying robotic and remote systems in their own unique challenging environments with the intentions of reducing risk to humans and the environment. In the US many universities and national labs continue their R&D efforts and deployment of robotics systems across the US nuclear weapons complex.

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. Earlier this year, the Nuclear Energy Agency (NEA) hosted a Workshop on the Application of Remote and Robotic systems in Nuclear Back End Activities – Way Forward in System Implementation. This international workshop was conducted at France's Marcoule site and took place on 30-31 January 2019. I had the honor of participating and representing robotics initiatives being conducted in the US and other countries. Also earlier this year at the Waste Management Symposia 2019 a good number of sessions (oral and posters), as well as panels, were dedicated to robotics for D&D, high level waste tanks inspections, and remote inspection of contaminated surfaces. International cooperation still moving strong with countries such as UK and South Korea. Recently our former chair, Dr. Mitch Pryor, participated in this pass summer



Robot Week in the UK (see article below). In addition, in France, the Nuclear Energy Agency (NEA) is busy organizing next summer's Robotic workshop. RRSD will be involved in the organization of the event and participating/presenting as well.

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.

Finally, ANS RRSD continues to collaborate with IEEE to conduct an international robotic topical projected for 2021. We hope to see you there.

Regards,

Leonel E. Lagos

Chair, RRSD

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2019 WM Symposia - Robotics & Remote Systems Programs

Robotics and remote systems (R&RS) was once again prominently represented at the Waste Management Symposia (March 2019, Phoenix AZ). The symposia was featured with a series of technical and panel sessions “Nuclear & Industrial Robotics, Remote Systems & Emerging Technologies.” They were organized and participated jointly by DOE-EM and RRSD, they provide a venue to share the past, present, and future directions of R&RS in the nuclear sector. In addition, R&RS technologies were presentations in sessions related to D&D of nuclear facilities and Japan Fukushima Daiich. Also noted in the symposia as a string participation by the universities at the industry exhibition, whereas robotics technologies were highlighted.

OECD-NEA Robotics Workshop

As mentioned in “*A Message from the Chair*” section, France’s Nuclear Energy Agency (NEA) is actively organizing an international workshop entitled “Application of Remote and Robotic Systems in the Nuclear Back-End.” The workshop is being programmed for summer 2020 in Paris, France. During the last few months, NEA has reached out to a group of international experts in the areas of robotics and decommissioning to develop the technical program. A few RRSD members are involved in this initiative, as well as, other recognized international experts such as Dr. Rustam Stolkin at the University of Birmingham’s National Centre for Nuclear Robotics (NCNR). Nominations of participants are being conducted and a meeting of Program Committee and Lectors has been scheduled for December, 2019 in Paris.

UK’s Nuclear Research Hub featured at UK’s Robot Week

Every summer brings [Robot Week](#) to the UK, which was hosted this year by [Imperial College of London](#). At the conference, the directors of the each of the Robotics Hubs completing research in hazardous environments including space ([FAIR](#)), energy ([ORCA](#)), and nuclear. These programs were launched in November, 2017 as part of the UK’s 3-year £84M R&D funding effort to deploy more ‘robotics and AI in extreme environments. Two hubs were created for the nuclear domain, including the National Centre for Nuclear Robotics ([NCNR](#)) directed by Rustam Stolkin at the University of Birmingham and the Robotics and AI in Nuclear Research Hub ([RAIN](#)) led by Barry Lennox at the University of Manchester. Funding through the

two hubs includes over 15 universities and national labs across the UK. Both groups have ramped up quickly with a variety of hardware presented in the exhibition hall, but both emphasized the scope of the problem, and the need for resources (particularly new personnel) produced in the initial three-year effort to be supported long enough for systems to find use in the UK’s [challenging environments](#).



OTHER EVENTS

RRSD Executive Committee Meeting in Minneapolis

The ANS summer meeting in Minneapolis 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. The meeting was presided by our chair (Dr. Leo Lagos) to go over business status, share ANS directions, and discuss/update business action items. Much discussion was devoted on future planning for the delayed ANS/IEEE joint conference on Robotics for Hazardous environments, and reinstating the next RRSD embedded topical meeting. RRSD has agreed to hold

bimonthly online EC meetings and continue to provide updates on the progress of business issues. Other business included participation in the ‘New and Emerging Technologies for D&D’ session at the ANS Winter meeting, as well as forming R&RS tracks in the 2019 Waste Management Symposia (WMS). An action item was also taken to pursue internal workshops among the participating RRSD EC members’ organizations.

UPCOMING EVENTS

ANS Winter Meeting Session: New and Emerging Technologies for D&D

This year at the ANS Winter Annual Meeting scheduled for November 17-20, 2019, the RRSD will collaborate with ANS Decommissioning and Environmental Science Division (DESD) and participate in a special panel entitled “Advanced and Innovative Technologies for Decommissioning of Nuclear Facilities and Environmental Remediation of Radiological Contamination.” This panel session will focus on innovative technologies for efficient, robust, and cost-effective decommissioning as well as remediation at radiologically contaminated

sites, including use of remote and robotic technologies; remote mobile monitoring systems; nanotechnology materials in groundwater remediation; advanced modeling and 3-D visualization for characterization; and “end-state” risk analysis in support of site closure decisions.

It is expected that the panelist will represent industry, government, academia, and international organizations involved in decommissioning and environmental remediation.

KAERI’s Workshop on International Cooperation for Unmanned Emergency Response Robotics for Nuclear Incidents

The robotics group of Korea Atomic Energy Research Institute (KAERI) has recently established a new test facility for emergency response robots, and invited RRSD among other international experts to a workshop on “International Cooperation for unmanned emergency response robotics for Nuclear Accidents” in conjunction with the open-house event. Following the Fukushima accident, various unmanned emergency response robotic systems have been developed in many countries for nuclear accidents. The objective of the workshop is to facilitate the exchange between researchers and end-users of unmanned emergency responsive robotic technology. Considering the fact that the R&D cost of unmanned robotics system is very high, international collaboration can be a cost effective approach to R&D. This workshop will entail presentations and discussions about the challenges of unmanned emergency response robotic systems as well as the way of cooperation. The

workshop will also offer opportunities for researchers and end-users to present results related to emerging technologies and capabilities for use in extreme environments, deployments of robotic and remote systems into hazardous environments, and developing standard requirements for such systems.



Welcome to Our New Executive Officers!



Jean R. Plummer
(Savana River
National Laboratory)



Vaibhav Sinha
(Ohio State University)

Joseph E. Kowalczyk
(Southern Company)

Out-going Members of the Executive Committee

Stephen Canfield (EC Member)
Jisup Yoon (EC Member)
Shikha Prasad (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 (m Pryor@utexas.edu) no later than September 29, 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, 2019: A slate of candidates must be identified by the Division Nomination Committee for the 2020 ballot.

2 November, 2019: Division Nominating Chair must report election slate to ANS HQ

31 December, 2019: All biographical information and candidate photos must be received by ANS HQ

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.