



# ANS HFICD

## Spring 2022 Newsletter

<http://hficd.ans.org>

This past year has been an eventful one, and it has been no different in the Human Factors and Instrumentation and Controls Division (HFICD) of the American Nuclear Society (ANS). Thankfully, the Spring 2022 newsletter is here to keep you informed on what is happening in HFICD. Over the last year or so, the division has hosted two virtual webinars, submitted several captivating articles in the August 2021 Nuclear News issue on instrumentation and control (I&C), announced several new division award winners, and successfully held its first virtual Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies (NPIC & HMIT) conference. On the following pages, the division is pleased to congratulate all of our 2021 award winners, with Dr. Ronald Boring and Dr. Rizwan Udden winning the Don Miller award, Dr. Sacit Cetiner winning the H.M. Hashemian Mid-Career award, and Dr. Fan Zhang winning the Ted Quinn Early Career award. The newsletter also includes some highlights from the recent HFICD webinar hosted last October, and I encourage you to visit the ANS website to watch both webinars we've developed if you missed them. I'm also excited to announce a new feature we are adding to the HFICD Newsletter, a Young Member Spotlight! Ryan Spangler at the University of Pittsburgh is our first spotlight, and we are looking forward to highlighting many of the valuable young members of our division in the future. Lastly, I hope to see many of you in person at the ANS Summer Meeting in Anaheim next month.

I hope that you enjoy the newsletter and thank you for being a part of HFICD!

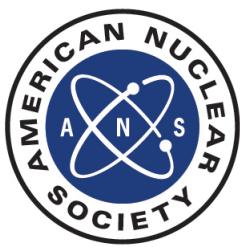
- Adam Deatherage, MBA  
AMS Corporation  
HFICD Communications  
Committee Chair

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Mark your calendars for the 2023 Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies Conference. Building on the success of the last conference held virtually in 2021, the next NPIC & HMIT will be held in beautiful Knoxville, TN. As a member of this division, please consider submitting a paper on your efforts in our field. We encourage you to be a part of this experience, and we are looking forward to seeing you there!



# ANS HFICD

## HFICD Awards

<http://hficd.ans.org>

### Don Miller Award

This award was established in 2009 by the ANS HFICD. It is named after Dr. Don W. Miller, Professor and distinguished Program Chair at the Ohio State University Nuclear Engineering Program, a prior member of the Advisory Committee on Reactor Safeguards, and past ANS President.

The award is given to an individual or team who has made recognized contributions to the advancement of one or both of the fields of nuclear instrumentation and control or human-machine interface through individual or combined activities that reflect the life and contributions of Dr. Miller.



Click [here](#) to submit a nomination for the Don Miller Award.

### H.M. Hashemian Mid-Career Award

This award was established in 2018 by the ANS HFICD. It is named after Dr. H.M. Hashemian, President and CEO of Analysis and Measurement Services Corporation, recognized expert in nuclear instrumentation and controls, and avid proponent of the future generation of nuclear scientists and engineers. This award recognizes an individual for sustained outstanding contributions to nuclear instrumentation and control, human factors engineering, or human machine interface over the first 15-25 years of his or her career.



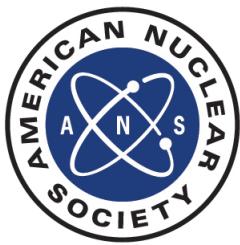
Click [here](#) to submit a nomination for the H.M. Hashemian Mid-Career Award.

### Ted Quinn Early-Career Award

This award was established in 2017 by the ANS HFICD. It is named after Mr. Ted Quinn, President of Technology Resources, recognized leader in I&C and former ANS President. This award highlights the importance of young members in the future developments of nuclear instrumentation and controls and human factors research, development, and deployment.



Click [here](#) to submit a nomination for the Ted Quinn Early-Career Award.



# ANS HFICD

## 2021 Don Miller Award Winners

<http://hficd.ans.org>

### Don Miller Award - *Ronald Boring*

Dr. Boring has been awarded the Don Miller award for his outstanding contributions to the nuclear industry's human factors community, especially in the areas of human reliability analysis, system design and evaluation. Dr. Boring is a Distinguished Human Factors Scientist and Department Manager at Idaho National Laboratory, where he has led research projects for the U.S. Nuclear Regulatory Commission, NASA, the U.S. Department of Energy (DOE), the Canadian Nuclear Safety Commission, the Department of Defense, and the Norwegian Research Council. He previously worked as a human reliability researcher at Sandia National Laboratories, a usability engineer for Microsoft Corporation and Expedia Corporation, a guest researcher in human-computer interaction at the National Research Council of Canada, and a visiting human factors scientist at OECD Halden Reactor Project. He and his research team developed the Guideline for Operator Nuclear Usability and Knowledge Elicitation (GONUKE) for conducting human factors in support of nuclear technologies, the Human Unimodel for Nuclear Technology to Enhance Reliability (HUNTER) dynamic human reliability framework, and the Advanced Nuclear Interface Modeling Environment (ANIME) for prototyping digital interfaces in nuclear power environments.



### Don Miller Award - *Rizwan Uddin*



Dr. Udden is Professor and Head of the Nuclear, Plasma, and Radiological Engineering Department at the University of Illinois at Urbana-Champaign. Dr. Udden has been awarded the Don Miller Award for his leadership in developing 3-D interactive 'environments' for student learning, for technical training, for effective control room and operations design, and for human factors research. Professor Udden has made seminal research contributions in the development and analysis of: two-phase flow and boiling water reactor stability; advanced numerical methods for thermal hydraulics problems, CFD, and large scale, high performance computing for nuclear applications; analytical benchmarks for heat transfer problems; and new self-consistent turbulence models and associated closure laws for flow in porous media. He is also—with much assistance from undergraduate students working in his lab—one of the pioneers in the development and use of 3-D immersive virtual reality systems and computer games for education and training in the nuclear field. Combining his work on human-machine interface in virtual and augmented reality, he has also contributed to the development of a test bed for the evaluation of digital control in a nuclear power plant control room.



# ANS HFICD

## 2021 H.M. Hashemian and Ted Quinn Award Winners

### H.M. Hashemian Mid-Career Award - *Sacit Cetiner*

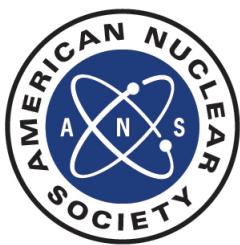
Dr. Cetiner is a senior research scientist in Idaho National Laboratory's Measurement Sciences department and Director of the Center for Reactor Instrumentation and Sensor physics at the Massachusetts Institute of Technology. Dr. Cetiner has been awarded the H.M. Hashemian Mid-Career award for his outstanding technical contributions to the field of measurement science including instrumentation, control, and data science. Over his career, Dr. Cetiner has supported a broad range of topics related to the general field of nuclear I&C from development of sensors, signal processing techniques, to developing supervisory control system concepts for multi-modular advanced reactors. He has served as the DOE technical point of contact for the versatile test reactor (VTR) Experiment I&C Area, and in this role oversaw a variety of projects including the development of self-powered neutron detectors tuned to the spectrum of the VTR. Dr. Cetiner also served as the I&C Thrust Lead for the Transformational Challenge Reactor program. His extraordinary commitment to the development of strong technical and management research practices in the digital system regulatory framework have provided a major improvement in the level of safety for nuclear facilities in the U.S. and around the world.



### Ted Quinn Early-Career Award - *Fan Zhang*



Dr. Zhang has been awarded the Ted Quinn early career award for Contributions to the research and development community for nuclear science and technology with emphasis on instrumentation and control and cyber security requirements and controls. Dr. Zhang is an Assistant Professor of Nuclear and Radiological Engineering & Medical Physics, at the Georgia Institute of Technology. Before joining the faculty at Georgia Tech, Dr. Zhang spent time at the University of Tennessee where she developed a high-fidelity non-linear model of a once-through steam generator in Matlab/Simulink. Dr. Zhang has also participated in an International Atomic Energy Agency Coordinated Research Program on cybersecurity, and continues research in cybersecurity for industrial control systems. Dr. Zhang also demonstrated notable technical leadership early in her post-graduation career. She successfully secured funding for research on cyber-physical security of industrial control systems through the U.S. Department of Energy Office of Nuclear Energy (NE) under the Nuclear Energy University Program (NEUP) program. She demonstrated technical depth and ingenuity demonstrating novel attack detection methods in support of adoption of digital instrumentation and control systems for nuclear power plants.



# ANS HFICD

## Young Member Spotlight - Ryan Spangler

My name is Ryan Spangler, and I am from a small town in rural Pennsylvania. After high school, I attended the University of Pittsburgh and graduated with a bachelor's degree in Mechanical Engineering. I worked in the automation industry briefly before returning to the University of Pittsburgh to further my graduate education. I am currently a Ph.D. candidate researching methods for improving asset management decision making for nuclear operations and maintenance.



### What initially interested you in the Nuclear Industry?

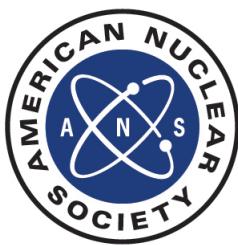
While earning my bachelor's degree, I was a co-op for a reactor coolant pump manufacturer where I was initially exposed to the navy and commercial nuclear industry. It was from that point on that I understood the importance of nuclear power and became intrigued! From there I began furthering my nuclear education and pursuing research in the nuclear industry.

### What is something interesting everyone in HFICD should know about you?

Something interesting about me is my passion for playing sports and outdoor recreation. I love being competitive in golf, hockey, bowling, snowboarding, and almost any other sport I can get my hands on! I also enjoy being outdoors, riding dirt bikes, camping, and going sailing.

### What's your biggest goal for the next 5 years?

My biggest goal for the next 5 years is to graduate with my doctoral degree and then pursue a career in the nuclear industry. My goal is to find work in one of the national laboratories or a position in the commercial nuclear industry where I can continue my research and passions.



# ANS HFICD

## Spring HFICD Webinar on Digital I&C

This past October, HFICD hosted a virtual lunch and learn focused on next generation nuclear I&C strategies. The panel consisted of four I&C professionals from NuScale, Terrapower, Westinghouse, and X-Energy who are currently working to ensure safe and reliable power from the next generation of nuclear reactors. With these new reactor designs come new challenges, as the higher operating temperatures, smaller footprints, unique coolants, and other design innovations really require different I&C approaches than what has been used in the current fleet of nuclear power plants. Each panelist provided a short presentation covering some of the unique I&C challenges and designs of their reactor, which was then followed by some robust Q&A.

If you missed the webinar, you can find the recording and the slides that were presented at: <https://www.ans.org/webinars/view-hficd2021/>. Be on the lookout for more information on our next HFICD webinar coming soon!



### **Brian Arnholt, NuScale Power, Supervisor of I&C Engineering**

Brian has been at NuScale for over 6 years and leads the design and licensing of the I&C systems for the NuScale plant design. He has a Bachelor's of Science degree in Nuclear Engineering from the University of Michigan in Ann Arbor, Michigan.



### **Thomas Tweedle, Principal Electrical Engineer, Westinghouse Electric Company**

Tom has a Bachelor's degree in Electrical Engineering from the Ohio State University and a Master's degree in electrical engineering from the University of Pittsburgh. Tom has over 15 years of experience at Westinghouse Electric Company leading I&C programs there. Currently, Tom is leading the eVinci I&C system development including sensor and I&C platform design.



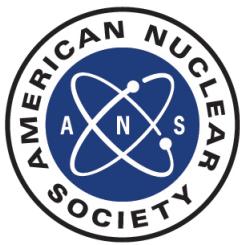
### **Yvonne Brits, Nuclear Engineer, X-Energy**

Yvonne Brits is the Supply Chain Manager and Operator Training Simulator Program Manager for the Xe-100 Plant. She received her Bachelor's degree in Electric and Electronic Engineering in 2006 and her Master's degree in Nuclear Engineering in 2010 from the North West University in South Africa. Yvonne is the project manager of a \$7.5M DOE ARPA-E project to reduce fixed O&M on the Xe-100 Plant and is busy earning her Ph.D. in Nuclear Engineering at North Carolina State University.



### **Chris Hope, Principal I&C Engineer, System Design, Terrapower**

Christopher Hope is a nuclear industry professional with more than 15 years of hands-on experience in analytical and control system software architecture. In his current position at Terrapower, Chris is the lead engineer responsible for the Natrium Reactor Protection system. His previous work includes Safety System Independent Verification and Validation (IV&V), Nuclear Real Time systems, Plant Process Controls and Cyber Security for operating Nuclear Power Plants in the United States and abroad.



# ANS HFICD

## HFICD Governance

<http://hficd.ans.org>

### 2021-2022 HFICD OFFICERS



Carol Smidts  
**CHAIR**  
Professor  
The Ohio State University



Daniel Cole  
**1st VICE CHAIR**  
Associate Professor  
University of Pittsburgh



Hyun Gook Kang  
**2ND VICE CHAIR**  
Associate Professor  
Rensselaer Polytechnic Institute



Ronald Boring  
**SECRETARY**  
Distinguished Scientist  
Idaho National Laboratory



PRADEEP RAMUHALLI  
**TREASURER**  
Nuclear Instrumentation and  
Controls Engineer  
Oak Ridge National Laboratory

### EXECUTIVE COMMITTEE (NEW MEMBERS)



Katrina Groth  
Associate Professor  
Mechanical Engineering  
University of Maryland



Shannon Eggers  
Senior Cyber Security Specialist  
Idaho National Laboratory



Ryan Spangler  
Ph.D. Candidate  
University of Pittsburgh



**Mehdi Tadjalli**  
**2020–2021**  
Project Engineer and  
Director  
Framatome

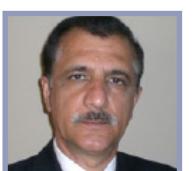


**Brent D. Shumaker**  
**2019–2020**  
Senior Engineering  
Manager  
AMS Corporation



**Raymond L. Herb**  
**2018–2019**  
Digital Principal, Fleet  
Design I&C  
Southern Nuclear  
Operating Company

### PAST HFICD CHAIRS

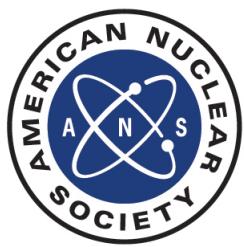


**Mehdi Tadjalli**  
**2020–2021**  
Project Engineer and  
Director  
Framatome



**Brent D. Shumaker**  
**2019–2020**  
Senior Engineering  
Manager  
AMS Corporation





# ANS HFICD

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## HFICD Executive Committee

### Term Ending in 2022

Ronald Boring  
Eric Harvey  
Hyun Gook Kang  
Pradeep Ramuhalli

### Term Ending in 2023

Brenden J. Heidrich  
Craig Primer  
Jamie Baalis Coble  
Padhraic Mulligan

### Term Ending in 2024

Nesrin Cetiner  
Adam Deatherage  
Ronald King  
Graeme West

### Ex Officio

Mehdi Tadjalli

## Upcoming ANS Meetings

### 2022 ANS Annual Meeting

**June 12-16, 2022**

Anaheim, California  
Anaheim Hilton

### 2022 ANS Winter Meeting and Technology Expo

**November 13-17, 2022**

Phoenix, Arizona  
Arizona Grand Resort

### 2023 ANS Annual Meeting

**June 11-14, 2023**

Indianapolis, IN  
Marriott Indianapolis Downtown

### 2023 13th NPIC & HMIT & PSA

**June 15-21, 2023**

Knoxville, TN