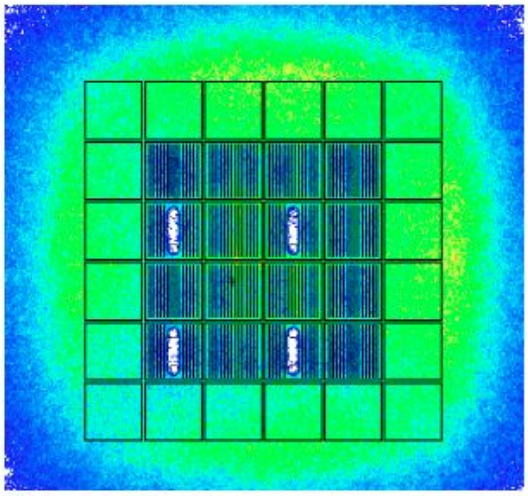
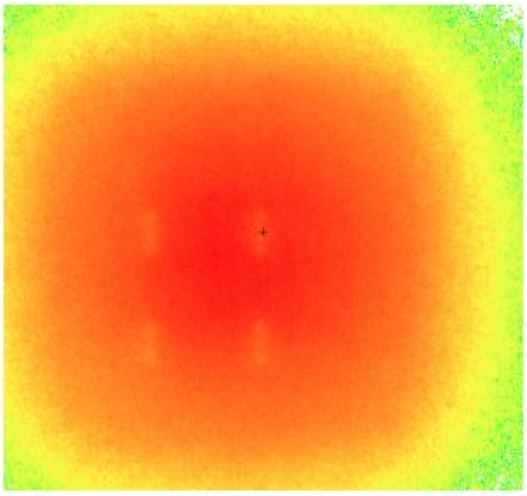
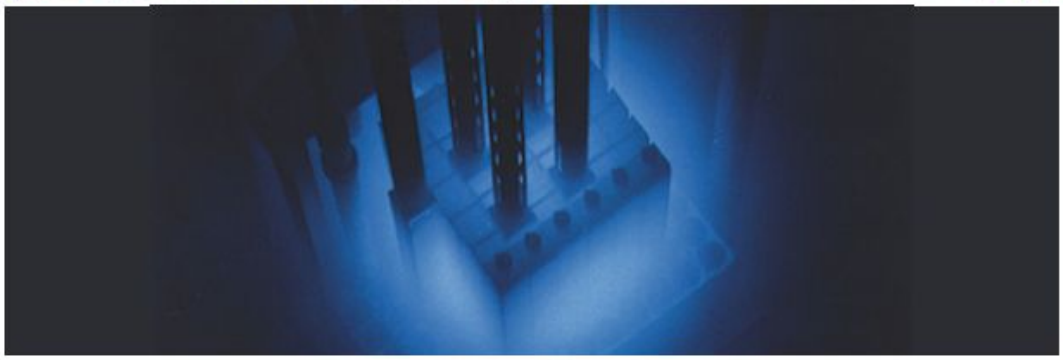
PURDUE UNIVERSITY PRESENTS

THE NATIONAL ORGANIZATION OF TEST, RESEARCH, AND TRAINING REACTORS

TRTR 2020







PURDUE UNIVERSITY
College of Engineering

Purdue University Presents
The National Organization of Test, Research, and Training Reactors
2020 Virtual Meeting
September 27-October 1, 2020

September 28, 2020

Happy 2020 TRTR Week to all-

When crisis hits, some choose to merely fight through or while others seize the opportunity to thrive. The nation's fleet of Test, Research, and Teaching Reactors have used the opportunity to strengthen the relationship among member facilities and re-affirm that as a community, the work we do must continue to provide value to the nation's critical infrastructure and scientific mission.

Some important progress has been made throughout the year. Under the leadership of Tom Newton, an effort has been underway to provide a standardized option to the member facilities for screening 50.59 changes. Additionally, in conjunction with a team of facility representatives (Geuther, Meffert, Lund, and Townsend) and Brenden Heidrich, an NSUF University Research Reactor Fitness Study Report was completed. It identified high priority issues for the US University research reactor community including Infrastructure, Regulatory, Staffing, and Utilization Challenges. Finally, the relationship between the Nuclear Energy Institute and TRTR has been enhanced. Through the hard work of Hilary Lane, the TRTR organization has utilized her leadership to navigate the global COVID-19 pandemic.

However, ground remains to be gained at individual facilities. There remain (and always will) areas of focus between the regulator and the community. Current topics gaining enhanced scrutiny are the medical and other operator qualification requirements, usage of "instant" Senior Reactor Operator applications, and the pending possible implementation of non-expiring licenses across the fleet. As the greater NRC continues its shift in applying the principles of performance-based and risk-informed regulations to provide enhanced operational flexibility and improved safety, the TRTR Community must work with the regulator to continue our respective missions as part of the nation's critical infrastructure. How can we apply similar principles as well as the directive of *minimum regulation* to enhance utilization and relevance of the RTRs? A partnership in safety should be based around open and transparent lines of communication between stakeholder groups.

Thank you so much for attending the 2020 (Virtual) Annual Meeting. See you online!

Clive Townsend

2020 TRTR Chair

2020 TRTR Speaker Schedule

	Monday (28)	Tuesday (29)	Wednesday (30)	Thursday (1)
12:00	Welcome & Opening	TRTR Business Meeting	NRC Day	Kalin Kiesling
12:30	Doug Morrell	Stephen Frantz (CO)		Travis Stoor
1:00	Melinda Krahenbuhl	Jared Hawley		Steve Reese
1:30	Robert Seymour	Robert Fretz		Josh Smith
2:00	Katy Huff	Allegations and Safety Culture		Jim Parry
2:30	NRC Cmr Baran			Kaitlin White
3:00	Rusty Towell	Colleen McClanahan		Nicolas Woolstenhulme
3:30	Patrick Park			Benesch, Shen, Estridge, Guynn
4:00	Bruce Meffert	Stephen Frantz (NOV)		
4:30	Vince Wang	NRC Cmr Hanson		Alice Capitoni
				Closing NC State

2020 TRTR Detailed Schedule

Monday, September 28

12:00 PM (Opening/Welcome, Clive Townsend)

12:30 PM (Doug Morrell)
This presentation will discuss the purpose and scope of the Department of Energy - Research Reactor Infrastructure (RRI) Program. Personnel involved in the program will be introduced and contact information will be provided for team member. Information will be provided to conference attendees as to the status of the core activities of the program. These activities include fresh fuel element fabrication and spent nuclear fuel shipment returns to the DOE. Current and future issues pertinent to the RRI program will also be presented.

The RRI program maintains fuels support contracts and provides nuclear reactor fuel at no or low cost to 24 U.S. universities operating a total of 25 reactor facilities. These facilities include:

- Twelve TRIGA facilities
- Eight plate fueled facilities
- Three AGN facilities
- One Pulstar fueled facility
- One Critical facility

The title for the fuel remains with the United States government and when the universities are finished with the fuel, the fuel is returned to the United States government for long-term storage.

Mission of the Research Reactor Infrastructure Program:

The Research Reactor Infrastructure Program is funded by the U.S. Department of Energy, Office of Nuclear Energy and is managed by the Idaho National Laboratory (INL) in Idaho Falls, Idaho. The program goals are:

- Keep all U.S. operating university reactor programs supplied with nuclear fuel.
- Provide assistance for movement of irradiated nuclear fuel from U.S. universities, after the DOE receipt facility authorizes the fuel receipt.

1:00 PM (Melinda Krahenbuhl)

Melinda will discuss lessons learned from recent findings by the US NRC as well as corrective actions completed prior to March 2020. These include improved record retention, changes to application procedures, and others.

1:30 PM (Robert Seymour)
In 2014, Kansas State University was awarded a $1.4M grant to purchase a new control system for their TRIGA MK II nuclear reactor. Six years later, what is it like?

Many in the TRTR community are already familiar with many of the setbacks, changes and disappointments that have made up a majority of the last 5 years. While some may consider this an opportunity to lay blame or point fingers, there is enough of that already. This is about what is actually here at Kansas State University and what we are doing to finish the project.

Thermo Fisher has delivered the console components and assembled them on a testing platform for us to test components and their compatibility with our existing systems. A process is planned to allow for concurrent monitoring of the reactor operations by the new console systems and our existing control console. Through this process, we will be able to make adjustments and component changes to ensure the smooth transition between the two systems. With the hybrid style of analog and digital monitoring, there are all the challenges of the analog world as well as all of the challenges of the digital. There is an additional challenge of the conversion.

With restrictions due to Covid along with the normal course and research schedules, The testing and proving of the new system is expected to take another year. Once this process is complete, there will be a maintenance shutdown that is expected to take about a month while we remove the old and install the new.

The new system enhances our educational program with better visualization for students as well as a more in-depth digital record of experimental data. This enhancement along with the full installation of our rabbit system for short-lived isotopes is essential to reach our goal to be a top research facility.

2:00 PM (Katy Huff)
Many University TRTRs were shut down in the 1980s & 1990s as student enrollments waned. In the 2000s, student enrollment in nuclear engineering and enthusiasm for carbon-free nuclear energy has rebounded mightily, but no new university TRTRs have been built in nearly 30 years. Simultaneous with this widening gap in hands-on training, unprecedented federal funding to demonstrate and commercialize advanced reactors is becoming available. But, in this future, who will test these reactors, train their operators, and improve the technology through experiments?

Universities are poised to play many of these roles in the future of next-generation nuclear reactor deployment and university campuses are uniquely suited for early deployments. We at UIUC have proposed that a next-generation university test, research, and training reactor could underpin advanced reactor commercialization toward national leadership in a clean, sustainable energy future. Our vision for the deployment of a next-generation university TRTR aims to amplify the profound expertise at our campus in research, education, and power production to address the urgent need for advanced reactor prototype testing as well as next-generation research toward integration with carbon-free energy technologies. In my brief comments, I will describe a vision of the future in which universities play a significant role in prototype testing next-generation reactors in support of commercial licensing and deployment, conduct operations research, drive innovations in associated technologies, and train a next-generation workforce to operate and maintain these next-generation devices.

2:30 PM (NRC Commissioner Jeff Baran)
The Honorable Jeff Baran was nominated by President Obama and sworn in as a Commissioner of the U.S. Nuclear Regulatory Commission on October 14, 2014. He is currently serving a term ending on June 30, 2023.

Since joining the Commission, Commissioner Baran's priorities have included ensuring effective implementation of safety enhancements in response to the Fukushima Daiichi accident, improving oversight of power reactors entering decommissioning, and boosting the openness and transparency of agency decision making. He has visited dozens of NRC-licensed facilities, including operating power reactors, a nuclear plant undergoing active decommissioning, research and test reactors, fuel cycle facilities, a low-level waste disposal facility, and a variety of facilities using radioactive materials for medical and industrial purposes. Commissioner Baran also traveled to Fukushima Daiichi for a first-hand look at conditions and activities at the site.

Before serving on the Commission, Commissioner Baran worked for the U.S. House of Representatives for over 11 years. During his tenure with the Energy and Commerce Committee, oversight of NRC was one of his primary areas of responsibility. As a senior counsel and later as Democratic Staff Director for Energy and Environment, Commissioner Baran worked on a range of NRC issues, including new reactor licensing, operating reactor oversight, decommissioning, high-level and low-level waste, and uranium mining, milling, and enrichment. He worked to coordinate the efforts of six federal agencies, including NRC, and two Native American tribes to clean up uranium contamination in and around the Navajo Nation. He also helped negotiate bills related to pipeline safety, energy efficiency, hydropower, electric grid reliability, and medical isotopes that were enacted with bipartisan support. From 2003 to 2008, he was counsel to the House Oversight and Government Reform Committee.

Prior to his work on Capitol Hill, Commissioner Baran served as a law clerk for Judge Lesley Wells of the U.S. District Court for the Northern District of Ohio.

Born and raised in the Chicago area, Commissioner Baran earned a bachelor's degree and a master's degree in political science from Ohio University. He holds a law degree from Harvard Law School.

3:00 PM (Rusty Towell)
Thanks for the email and invitation to present at this meeting. We would welcome the opportunity to share our plans and progress to build a Molten Salt Research Reactor at Abilene Christian University. Below is a simple abstract for a single talk to present an overview of the project. If you'd suggest additional talks with more detailed information, please let us know and we will be happy to encourage other submissions from other members of the team.

3:30 PM (Patrick Park)

"MCNP Learning Opportunities from a Liberal Arts College": Patrick Park (Physics, '22, he/him) is an undergraduate operator and maintains the only Monte Carlo N-Particle code (MCNP) license at the Reed College Research Reactor (250 kW TRIGA Mk.I). Since Reed College has no nuclear engineering major, Patrick will discuss how his attempts to learn MCNP as an undergraduate brought him to various universities and laboratories across the U.S. and abroad.

Patrick's first exposure to MCNP at UC Irvine's facility in Summer 2019, where he worked with student Tino Bassi, then-supervisor Jonathan Wallick, and Dr. George Miller on manufacturing a delayed neutron system and an automated sample changer for the TRIGA rotary specimen rack. Here, he learned how MCNP could have helped predict how well his mechanical systems withstand irradiation. Then, he attended the Introduction to MCNP course at Los Alamos National Laboratory in October 2019, of which Patrick will discuss curriculum covered and travel tips. In January 2020, Patrick flew out to South Korea to tour their nuclear research facilities, where he learned about MCCARD, Korea's native neutronics code, developed from MCNP by Seoul National University. This summer, Patrick worked remotely with Dr. Dagistan Sahin and Dr. Danyal Turkoglu at the NIST Center for Neutron Research. He will cover his work involved in the use of a Python script to generate MCNP decks to determine the effect of variable-width control blades on reactor control. Finally, Patrick will summarize how these experiences shaped his ongoing MCNP projects at Reed, such as using lessons learned from the NCNR to simulate the 1/M criticality experiment with MCNP and a Python wrapper.

Each opportunity was funded by or awarded the Reed College Summer Opportunity Fellowship, Opportunity Grant, International Travel Fellowship, and the NIST Summer Undergraduate Research Fellowship (funding rescinded due to COVID-19), respectively.

4:00 PM (Bruce Meffert)

The University of Missouri Research Reactor (MURR®) Regulating Rod Drive Mechanism (RRDM) was recently replaced with a new style drive mechanism, which was designed, fabricated and tested entirely by MURR staff. The RRDM positions the stainless-steel regulating rod, a low worth rod which allows for very fine adjustments in the neutron density in order to maintain the reactor at the desired power level, either in the automatic or manual control modes. The previous RRDM had been in operation for nearly 54 years and since 1974 there had been 25 Licensee Event Reports (LERs) submitted to the U.S. Nuclear Regulatory Commission (NRC) that have been attributed to various failures of the RRDM during reactor operation. In addition to not having a direct replacement RRDM available, various control functions on the RRDM were extremely antiquated, such as the drive chains and geared rotary limit switches, with much more robust, dependable and newer technology replacement parts now available that should significantly increase the reliability of the RRDM. Therefore, instead of fabricating a new RRDM as currently designed, certain RRDM functions have been redesigned using these newer technology replacement parts. A second RRDM is currently being fabricated as an available spare since this new design is proving reliable. A discussion of the significant improvements in the new design will be presented, such as a more robust servomotor and gearbox, a new hysteresis braking system, replacement of geared rotary limit switches with linear-actuated limit switches, etc. Additionally, a discussion will also be presented on the rigorous benchtop testing program which enabled us to accelerate 6 months of continuous use within a 6-week period using a programmed test sequence and equipment. Half-way through the test sequence the RRDM was disassembled and inspected for any abnormalities or unusual wear.

4:30 PM (Vince Wang)

A systematic and detailed simulation/experiment for the University of Utah TRIGA Reactor (UUTR) in support of profiling detailed neutron flux distribution is presented in this work. We utilized both a 3-D Cartesian SN deterministic code, PENTRAN, and a Monte Carlo code, MCNP6, to calculate a

hyperaccurate 3-D core flux distribution of the UUTR under full power all rods out condition. Analysis shows that a 14-energy group library, with up-scattering in the last 5 groups is appropriate for obtaining a converged high resolution UUTR core neutron flux distribution for PENTRAN calculations. Systematic comparison with MCNP6 is also performed; results show that less than a 2% average flux difference is observed between PENTRAN and MCNP6 calculations. An experiment using an arsenic sample irradiated in the Thermal Irradiation (TI) facility is also performed for validation of the PENTRAN calculation. Excellent agreement, less than 3%, between experiment and computation is observed for the reaction rate

Tuesday, September 29

12:00 PM
Business Meeting of the TRTR Organization.

12:30 PM (Stephen Frantz)

On March 16, 2020 Reed College received a Confirmatory Order regarding apparent violations with respect to submitting information to the Nuclear Regulatory Commission and with respect to our Security Plan.

This talk will discuss the circumstance that lead to the Confirmatory Order and to identify some lessons learned that may be of use to others in the TRTR community.

1:00 PM (Jared Hawley)
Like many facilities that have been in service for a long time, the Advanced Test Reactor has a number of digital systems running on obsolete hardware for which no replacement parts are available. Moreover, many of these systems are highly customized and written in outdated software for which expertise is becoming increasingly hard to find. Add to that the fact that such legacy systems were typically not designed with modern cyber security requirements in mind, and the result is a collection of very important systems that can be challenging, even intimidating, to replace.

In this presentation we will discuss how ATR has been working over the past two years to overcome some of these challenges as we have systematically replaced our legacy digital systems. We will use two specific upgrade projects to highlight specific challenges, share strategies used to address those challenges, and discuss lessons learned from those projects.

1:30 PM (Robert Fretz)
The U.S. Nuclear Regulatory Commission (NRC) derives its principal authority to license and regulate the civilian use of nuclear materials from the Atomic Energy Act (AEA) of 1954, as amended, which provides broad authority to license and regulate the civilian use of nuclear materials, and the Energy Reorganization Act (ERA) of 1974, as amended. Section 104.c of the AEA states that the Commission may issue licenses for utilization and production facilities for research and development activities and directs the Commission "to impose only such minimum amount of regulation of the licensee as the Commission finds will permit the Commission to fulfill its obligations under this Act to promote the common defense and security and to protect the health and safety of the Public and will permit the conduct of widespread and diverse research and development." The NRC's Enforcement Program supports the agency's safety and security mission by emphasizing the importance of compliance with NRC requirements, and by encouraging prompt

identification and prompt comprehensive correction of violations of NRC requirements. This presentation provides a brief overview of the NRC's Enforcement Program, and aspects of the enforcement process important to the test, research, and training reactor community.

2:00 PM (Allegations and Safety Culture)

3:00 PM (Colleen McClanahan)
The mission of the FBI is to protect the American people and uphold the Constitution of the United States. The FBI created the Weapons of Mass Destruction Directorate (WMDD) to build a cohesive and coordinated approach to incidents involving chemical, biological, radiological, nuclear, or explosive (CBRNe) material—with an overriding focus on prevention. Through a nuclear and radiological tripwire initiative, the FBI provides awareness briefing that discuss potential threats and vulnerabilities regarding the use of, research of, or manufacturing of radiological sources. The purpose of this presentation is to discuss: An overview of the FBI, the role of the WMD Coordinator, types of threats applicable to TRTR annual meeting attendees, suspicious behaviors, and real world case studies.

4:00 PM (Stephen Frantz)
On September 2, 2020 Reed College received a Notice of Violation for operating the Reed Research Reactor during a period when its Ventilation System did not fully meet the requirements of being operable under Technical Specifications. This was caused by an incorrect interpretation of the operability of the Ventilation System under Technical Specifications.

This talk will discuss the unusual circumstances that lead to the violation and to identify some lessons learned that may be of use to others in the TRTR community.

4:30 PM (NRC Cmr Hanson)
The Honorable Christopher T. Hanson was sworn in as a Commissioner of the U.S. Nuclear Regulatory Commission on June 8, 2020, and is filling the remainder of a five-year term ending on June 30, 2024.
Hanson has more than two decades of government and private-sector experience in the fields of nuclear energy. Prior to joining the NRC, he served as a Staff Member on the Senate Appropriations Committee, where he oversaw civilian and national security nuclear programs.

Before working in the Senate, Hanson served as a Senior Advisor in the Department of Energy's Office of Nuclear Energy. He also served in the Office of the Chief Financial Officer, where he oversaw nuclear and environmental cleanup programs, and managed the Department's relationship with Congressional Appropriations Committees. Prior to joining the Department, he served as a consultant at Booz Allen Hamilton where he led multiple engagements for government and industry in the energy sector.

Hanson earned master's degrees from Yale Divinity School and Yale School of Forestry and Environmental Studies, where he focused on ethics and natural resource economics. He earned a Bachelor of Arts degree in Religious Studies from Valparaiso University in Valparaiso, Indiana.

Wednesday, September 30

NRC Day

Thursday, October 1

12:00 PM (Kalin Kiesling)
Professional nuclear societies and organizations have an obligation to create inclusive spaces to promote diversity and equity in the nuclear industry. These spaces provide unique opportunities for both personal career advancement and overall advancement of the field. Without diverse and inclusive professional societies, the nuclear community risks losing out on talent, and therefore slowing progress. This talk will cover broad definitions of diversity, equity, and inclusion and motivation for their improvement, followed by illustrations of individual and systemic actions for allyship to foster diversity, equity, and inclusion in the nuclear community.

12:30 PM (Travis Stoor)

1:00 PM (Steve Reese)

Peer reviews of a facility performed by members of the TRTR community are two- or three-day on-site assessments performed at the invitation of the requesting facility. Peer reviews can be a powerful tool for addressing issues, whether they be political, financial, or in an effort to address a concern. Over the years, a number of these reviews have been performed. A description of the peer review process will be described as well as a discussion of general observations and common themes.

1:30 PM (Josh Smith)
The Annular Core Research Reactor (ACRR) has been in a prolonged maintenance mode since September of 2019 due to equipment failures and operational errors. This has caused a significant reduction in normal operations and has resulted in a transition to a recovery mode to fix deficient conditions. Normally ~300-400 operations are performed a year, and now it has been reduced to ~30 operations. In addition, many staffing changes have occurred (five new operators in training, a new manager, two new reactor supervisors), which has caused additional workload for the existing staff. The challenges in returning ACRR to an operational state will be discussed in further detail herein.

The initiating event for many of the recent issues at ACRR has been aging equipment. A nickel plate rigging failure and a loose bolt on a Safety Rod (SR1) connecting rod led to further investigations and identification of more deficient conditions. Equipment failures and operational errors while implementing recovery actions caused additional work to be performed. Repair of the loose bolt on SR1 resulted in identification of a cladding breach. Search for foreign material led to identification of a suspect fuel element #134. During staging activities to remove fuel element #134, the fuel element transfer container (15-element rack) failed during testing. Additional Foreign Material Exclusion (FME) concerns (dropped bolts, loose bolts and washers on the safety plate, and legacy FME) have caused significant recovery and retrieval work. There have been accomplishments to address FME including successful deployment of a Foreign Object Search and Retrieval (FOSAR) Crawler to remove legacy foreign material on the pool floor.

There have been many lessons learned in the areas of FME controls, aging equipment, infrequently performed tasks, inexperience with new staffing, and distractions due to multiple concurrent events. The coronavirus (COVID-19) added additional complexity to performing maintenance to fix the deficient conditions. The number of people who could perform work was limited from COVID-19. Communication with masks was more difficult and planning meetings were held via Skype. Future work at ACRR includes development of advanced fuel inspection techniques. This includes building a test rig to hold the fuel and testing to include: visual inspections, ultrasonic testing, Go/No-Go fit testing, and hermeticity testing. Visual inspection criteria will examine for scratches, dents, corrosion, and weld integrity.

2:00 PM (Jim Parry)

The Transient REActor Test (TREAT) facility was restarted in 2017 to perform reactor fuels testing under transient conditions, following shutdown in 1994 and 23 years in non-operational standby. TREAT is a transient reactor that, like most pulsing reactors, can create natural shaped power pulses. However, TREAT provides the ability to shape the power pulse and control the energy deposition rate on the test specimens by automatically controlling the amount of reactivity insertion over time. The original automatic reactor control system (ARCS) was created in the 1980s using INTEL 8086 CPU boards and software written in assembly code. The need to maintain the system for the next 40+ years of TREAT life led to the decision to replace ARCS with modern hardware while maintaining the original functionality. After a prototyping effort, the replacement was successfully completed in the first quarter of 2020. The process and results of that effort are reported here.

3:00 PM (Nicolas Woolstenhulme)

The Transient Reactor Test (TREAT) facility was constructed in the late 1950's, provided thousands of transient irradiations before being placed in standby in 1994, and was restarted in 2017 in order to resume its crucial role in nuclear-heated safety research. Advances in modern computational capabilities and a resurgence of interest in novel reactor technology have created an opportunity for emphasizing modern science-based and separate effects test capabilities at TREAT. An innovative approach to this type of testing leverages the relatively low radioisotope accumulation during brief TREAT irradiations by arranging small fresh fuel specimens in low activation hardware "modules" so that they can be easily extracted and shipped for examination within weeks. The concept was termed the Minimal Activation Retrievable Capsule Holder (MARCH) irradiation vehicle system. The Accident Tolerant Fuels program sponsored the first modern fueled test to be performed in TREAT using the MARCH system in 2018 and continues to develop enhanced modules for water environment fuel safety research. Other tests modules have been or will be deployed to address further research pertaining to nuclear thermal propulsion, liquid metal cooled reactors, microreactor fuel technologies, and other transient science needs.

3:30 PM (Benesch, Shen, Estridge, Guynn)

The Reed College Research Reactor (RRR, 250 kW TRIGA Mk.I) maintained 42 NRC operator licenses among a total of 61 staff members, of which all but 3 are undergraduate students, as of Fall 2019. Various student staff members will present on the multiple facets of Reed's operator training, public outreach, and student projects.

“Reed College RO/SRO Training Program”: Training Supervisors M Benesch (Linguistics, ’22, they/them) and Nemo Shen (Linguistics, ’21, he/him) will discuss at length Reed’s successful operator training program, which selects, trains, and licenses around 15 ROs and up to 10 SROs each year. Key elements of the training include intensive lectures, quizzes, checkoffs, drills, practice NRC exams, and independent training projects, which are often held outside of regular classroom hours for no academic credit. In addition, a positive and supportive work environment honed by the staff culture has allowed Reed to attract gender minorities and non-STEM majors into its staff ranks, affirming its mission of introducing nuclear knowledge to all students.

“Virtual Lab Simulation and Other Public Outreach at the RRR”: Technician Laura Estridge (Physics, ’22, she/her) will explain how Reed’s facility conducts its outreach to serve the Portland area, with over 45 tours and 1,500 visitors from universities, public schools, and special groups in 2019. She will also describe how Reed is adapting to maintain outreach during the COVID-19 pandemic, including her own project of simulating a radioactive decay lab often done with tour groups into an online-accessible application via Unity.

“Undergraduate Projects at the RRR and Preliminary Investigation of Gamma Ray Sensitivity of the Cyanotype Printing Process”: Projects Supervisor Addison Guynn (Chemistry, ’21, she/her) will go over the details and importance of student-led independent projects at the facility. She will also present some preliminary observations from her recent project, which tested the gamma ray sensitivity of the cyanotype printing process.

4:30 PM (Alice Capitoni)

Alice Caponiti serves as the Deputy Assistant Secretary for Reactor Fleet and Advanced Reactor Deployment in the Office of Nuclear Energy. She leads a diverse portfolio of research, development and demonstration programs focused on the technical and economic sustainability of the existing U.S. fleet of commercial reactors and the development and deployment of innovative advanced reactors, including small modular reactors and microreactors. Ms. Caponiti is managing a new cost-shared program with industry to demonstrate multiple advanced reactor designs that offer improved safety, functionality and affordability, leading to expanded market opportunities for clean energy. Her office also sustains the nuclear talent pipeline through competitive university R&D and infrastructure investment programs. Ms. Caponiti serves on the Generation IV International Forum Policy Group that advises on research and development needed to establish the feasibility and performance capabilities of the next generation nuclear energy systems.

Ms. Caponiti previously led efforts to design, build, test, and deliver safe and reliable nuclear power systems for space exploration and national security applications and conduct detailed safety analyses for each mission. She served as the as the technical advisor to the Department of State and a United Nations working group on space nuclear power sources, as well as a risk communications spokesperson for the New Horizons mission to Pluto and the Mars Science Laboratory mission that delivered the Curiosity rover to the surface of Mars. Prior to joining the Office of Nuclear Energy in 2001, Ms. Caponiti worked on a nonproliferation program to reduce stockpiles of excess Russian weapons plutonium.

Ms. Caponiti has a bachelor's degree in civil engineering from the University of Maryland and master degrees in nuclear engineering and the Technology and Policy Program from the Massachusetts Institute of Technology.