



NE Student Outreach



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Activities in 2016

2016 NE Summer Intern Seminar Series

These seminars provide a taste of some of the Division's important work to address global problems such as proliferation of nuclear materials, used fuel disposition (called "waste" in current public discourse) and developing a sustainable energy system. Students from other divisions are invited to attend.

Target Audience: Summer Students in NE or other Argonne Divisions.

DOWNLOAD: [2016 NE Summer Intern Seminar Series](#) [476.22 KB, last mod.: June 06 2016, 17:01]



Welcome to NE and Intern Orientation

Tom Ewing, Associate Director, [Nuclear Engineering Division](#)

June 2, 2016, 11:00 am, location: Bldg. 202 Room B169



NOTE: Seminar will be followed by a Student Welcome Lunch.

Seminar Abstract:

Tom Ewing, Associate Director of the NE Division, will welcome NE summer interns and provide a short overview of Division activities. The Outreach Committee will discuss planned intern activities and introduce pertinent Division employees. NE IT Support will provide a short overview about cyber security and the NE Help Ticket system, and the Budget Office will show the research aides how to enter their time in Dayforce. Lunch will be provided.

[Print abstract](#)

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Early Career Seminar: Experiments in Natural Circulation for Passive Decay Heat Removal

Darius Lisowski, Nuclear Engineer, Engineering Development Labs

June 7, 2016, 10:00 am, location: Bldg. 203 Auditorium

Seminar Abstract:

Passive systems have become one of the primary focus areas for safety and decay heat removal in advanced reactor concepts. Of these systems, natural circulation air and water loops have the potential to offer exceptional performance with relatively simplicity in design. However buoyancy driven flow readily exhibits complex and uncertain behavior, often times invoking a wide range of thermal hydraulic behavior with minimal changes in operating conditions due to their inherent sensitivity. The focus of this seminar will be on physical studies of these systems and their phenomena with examples drawn from on-going research on both air and water driven test facilities. First an overview of the design of the air-

based test facility at Argonne will be presented, followed by results and observations from over 2,200 hours of active test operations. Then, an introduction to the planned water-based transformation will be given with details of the AREVA concept design being constructed at Argonne. Remarks of best practices, along with some of the instrumentation commonly used on such test facilities, will also be presented.

 [Print abstract](#)

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Radiological Forensics – Putting the Pieces Together

Jodi Canaday, Forensics Technical Data Specialist, Nuclear Forensics Section

 **June 14, 2016**, 10:00 am, location: Bldg. 205 Y-Wing Auditorium

Seminar Abstract:

In the event of a terrorist obtaining and possibly detonating a device with radiological material, radiological forensic analysis could provide law enforcement with valuable clues to the origin of the material; this information could then provide further leads on where the source or material was obtained. This presentation will highlight the radiological forensics projects and subject matter expertise in the Nuclear Engineering Division while working through a hypothetical radiological dispersal device scenario.

 [Print abstract](#)

[Download Seminar Presentation \[not available yet\]](#)



Sodium-cooled Fast Reactor – Past and Future

Taek K. Kim, Principal Nuclear Engineer and Department Manager, Nuclear Systems Analysis

 **June 21, 2016**, 10:00 am, location: Bldg. 205 Y-Wing Auditorium

Seminar Abstract:

Since the first electricity from nuclear energy was obtained at Experimental Breeder Reactor I (EBR-I) on December 20, 1951, we have dreamed of a sustainable nuclear fuel cycle for the ideal use of nuclear energy resources and the Sodium-cooled Fast Reactor (SFR) technology has been at the center of that dream. The United States has designed, built, and operated fast reactors (mostly SFRs) from EBR-I up until the Fast Flux Test Facility (FFTF) and Experimental Breeder Reactor II (EBR-II) were permanently shut down and the IFR program was canceled in 1994. Worldwide, SFR technologies have logged more than 400 operating-years, and many countries (China, India, Russia, Japan, France, Korea, and even the U.S.) have very active plans for SFR deployment in the near future. In this seminar, the history of SFR development will be discussed, including the critical turning points of nuclear system development in the United States and the reasoning behind the recent refocus on SFR technology.

 [Print abstract](#)



Rational and Future Prospects for Integral Fast Reactor

Yoon Chang, Argonne Distinguished Fellow

 **June 28, 2016**, 11:00 am, location: Bldg. 203 Auditorium

 **Note time change.**

Seminar Abstract:

The Integral Fast Reactor (IFR) was developed at Argonne in the 80s and 90s as a next-generation reactor concept. The major goals of IFR were twofold: (1) much enhanced inherent safety as required for the next generation nuclear, and (2) innovative fuel cycle technology to resolve waste management, nonproliferation and economics concerns. Metal fuel and pyroprocessing are the key technology innovations to achieve these goals.

The current status of the future prospects of IFR-type sodium-cooled fast reactors will also be discussed, including Prototype Generation-IV Sodium-cooled Fast Reactor (PGSFR), being developed by Korea Atomic Energy Research Institute (KAERI) in collaboration with Argonne and KEPCO E&C.

 [Print abstract](#)

[Download Seminar Presentation \[not available yet\]](#)



Reactor Conversion

John Stevens, Principal Nuclear Engineer and Department Manager, Research & Test Reactor

📅 July 5, 2016, 10:00 am, location: Bldg. 203 Auditorium

Seminar Abstract:
[Not yet available]



Fast Reactor Physics

Florent Heidet, Principal Nuclear Engineer, Reactor and Fuel Cycle Analysis Section

📅 July 12, 2016, 10:00 am, location: Bldg. 203 Auditorium

Seminar Abstract:

How fast reactor physics differs from thermal reactor physics, and how the fast spectrum allows pursuit of various strategic objectives, e.g., resource extension, actinide burnup in lieu of disposal, weapons material disposition.

📄 [Print abstract](#)

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Advanced Modeling & Simulation for Nuclear Reactors

Justin Thomas, Principal Nuclear Engineer, Engineering Simulations Section

📅 July 19, 2016, 10:00 am, location: Bldg. 203 Auditorium

Seminar Abstract:

Argonne supports the development of SHARP, an advanced multi-physics and multi-scale toolkit for predictive simulation of nuclear reactors. By leveraging modern high-performance computers and incorporating validation into the development process, SHARP will be able to

help reactor designers pursue transformative concepts and gain insight into physical phenomena difficult to obtain through experiments alone.

📄 [Print abstract](#)

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Early Career Seminar: Production of $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ Medical Isotope without Use of Uranium

Peter Tkac, Chemist, Radiochemistry Section

📅 July 26, 2016, 10:00 am, location: Bldg. 205 Y-Wing Auditorium

Seminar Abstract:

Several promising non-uranium pathways exist for the production of $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ without use of enriched-uranium targets. As well as the well-known neutron irradiation of ^{98}Mo , cyclotron production of $^{99\text{m}}\text{Tc}$ using $^{100}\text{Mo}(p,2n)^{99\text{m}}\text{Tc}$, and production of ^{99}Mo by $^{100}\text{Mo}(\gamma,n)^{99}\text{Mo}$ reaction using electron accelerator are the feasible options. These accelerator technologies offer a viable alternative to reactor produced ^{99}Mo , mostly due to lower start-up costs, commercial availability, fast post-irradiation processing and easier licensing procedures. On the other hand, use of Mo targets requires major change in the current generator technology to accommodate for the high concentration of Mo. Moreover, an estimated cost for >95% enriched $^{98/100}\text{Mo}$ is about \$1,000/g for kilogram quantities. Due to very high cost of the enriched target material, it is very important that potential manufacturers have ways to efficiently recycle it.

The focus of this seminar will be on experimental results obtained from irradiations of enriched ^{100}Mo targets using electron linac performed at Argonne, post-irradiation processing, production-scale dissolution studies, and development of a recycle process for enriched Mo material.

📄 [Print abstract](#)

Download Seminar Viewgraphs [not available yet]

Used Nuclear Fuel Management in the U.S.



Mark Nutt, Principal Nuclear Engineer and Manager, Spent Nuclear Fuel Management Section

 **August 2, 2016**, 10:30 am, location: Bldg. 203 Auditorium

Seminar Abstract:

The seminar will provide a brief history of nuclear waste management in the U.S. since the inception of nuclear power through the present. The impacts of the decision to no longer pursue development of the Yucca Mountain geologic repository will be discussed. The recommendations made by the Blue Ribbon Commission for Americas Nuclear Future will be summarized and the U.S. Department of Energy's (DOE) strategy for managing used nuclear fuel going forward will be presented. On-going activities in the DOE's Used Fuel Disposition Research and Development Campaign and Nuclear Fuel Storage and Transportation Planning Project will be described.

 [Print abstract](#)

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Other Activities

Information about current and or upcoming activities can be found in the [NE Student Outreach](#) home page.

Contact the Student Outreach Committee

If you would like to contact the NE Student Outreach Committee for further information or to request a student activity, please email neoutreach@anl.gov .

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