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American Nuclear Society
Trinity Section

ZOOM MEETING ANNOUNCEMENT

https://us02web.zoom.us/j/81405708981?pwd=ZGRxUkhvVEl3QTl0UFFlaUVZQ3VvQT09

"Lightning Talks #2"

Background: Because of the constraints that the COVID-19 pandemic have placed on in-person gatherings, it's been too long since we've been able to get together in person and share both camaraderie and professional discussions—to "socialize" with each other (from students to emeritus members) and to hear about current activities and interests.

To that end, Trinity Section is hosting the second in our series of "virtual dinner meeting with speakers." Of course, dinner and libations are whatever you choose to provide at your individual locations, but at least we can offer some professional interaction in the form of "lightning talks" and an opportunity for discussion.

Each of these talks is targeted for about 15 minutes, including a short Q&A period. At the end, there will be a more general opportunity for member discussion.

Abstracts: please see next page.

Directions: This meeting will be hosted on Zoom. The sign-in link will be posted on the Calendar page of our web site (http://local.ans.org/trinity/calendar.html).

Date: **Tuesday, November 24, 2020**

Time: **7:00pm (MST)** Speakers and discussion

Cost/Menu: Whatever you choose to provide at your individual locations.

And you don't even need to sign up from our web site or pay with PayPal.

RSVP: No need to tell us ahead of time. However, if you have ideas for speakers and topics of interest for either another lightning talk session or for an in-person dinner meeting with speaker when we're able to accommodate that in the future, or if you are willing to present a lightning talk about your own current work, please be in touch with us through:

Chris Perfetti: cperfetti@unm.edu (505-277-1945) or
Travis Trahan: travistrahan@gmail.com (505-695-5078).

"Oil for Atoms"

Richard (Dick) Malenfant,
Los Alamos National Laboratory, Retired

Abstract: An agreement was signed between the United States and the Democratic Peoples Republic of Korea (DPRK) in 1994 to provide Heavy Fuel Oil (HFO) to replace the "need for nuclear." It was reported that some of the first shipment in January, 1995, was not all used for the agreed purposes of heating and power production. This resulted in an embargo on shipments until a means had been implemented to assure compliance. I was a member of the three-person team sent to North Korea to negotiate a resolution. This presentation will consist of a summary of the report sent to the Department of Energy following the trip.

"Stationary CT Design for Real-Time 4D Imaging"

Dr. Hyoung Koo (Hank) Lee,
Professor of Nuclear Engineering and Chair, Nuclear Engineering Department, UNM

Abstract: Various imaging techniques have been integral to methods and tools for research in science and engineering. Researchers working on imaging keep introducing new applications of nuclear imaging for security and safeguards, nondestructive characterization (NDC), and nondestructive testing (NDT) as well as medical diagnosis. These new applications require new imaging architectures and better spatial and/or temporal resolutions. Dr. Hyoung Lee aims to develop new imaging system architectures, software, and algorithms to overcome the limitations of the current imaging systems and to widen applications of nuclear imaging. His recent and on-going research projects toward medical diagnosis, NDT, and nuclear security and safeguards applications include new x-ray tube design for stationary computed tomography (CT), submersible gamma-ray transmission and emission tomography, neutron and x-ray combined CT, flat-panel x-ray source, and development of algorithms for CT reconstruction, image analysis, machine vision, and image fusion.

As an attempt to develop a real-time 4D CT system, Dr. Lee is investigating a stationary CT architecture, which removes the need for a rotating gantry by electronically sweeping one or more x-ray beams across the field-of-view and by using two separate and stationary arrays: one for x-ray sources and the other for detectors. In order to develop such a stationary CT architecture, the first step is to develop a compact and fast x-ray tube so that a sufficient number of x-ray sources can be contained in the stationary source array. Funded by Army Research Lab, Dr. Lee is developing a new x-ray tube that fits the requirements of an x-ray source to be used in the stationary CT system.

"Overview of the Safety Case for the Kairos Power Fluoride Salt-Cooled High Temperature Reactor"

Dr. Matthew R. Denman,
Principal Engineer, Reliability Engineering Department, Kairos Power

Abstract: Kairos Power is an advanced nuclear reactor company headquartered in Alameda, CA with a testing and manufacturing facility in Albuquerque, NM and a licensing center in Charlotte, NC. The key to Kairos Power's success lies in two areas: a simplified safety case which credits only the TRISO fuel and Flibe salt for safety-related radionuclide retention and a rapid iteration program focused on reducing cost-uncertainties in the final product. This talk will focus on the simplified safety case and explains the process through which large safety margins are leveraged reduce the safety-related footprint of the reactor. This compact safety case will ensure that the design team has the flexibility they need when designing an economically competitive Fluoride Salt-Cooled High Temperature Reactor.

"MELCOR and Next Generation Nuclear Energy Safety Technology"

Dr. David L. Luxat (presented by Jesse Phillips),
Severe Accident Mod/Analysis, Sandia National Laboratories

Abstract: MELCOR is an integral nuclear energy safety analysis code developed by Sandia National Laboratories for the U.S. Nuclear Regulatory Commission (NRC). It has undergone significant evolution over the past nearly 40 years. Throughout this long history of development, MELCOR has proven critical to characterizing the realistic level of risk to public health and safety posed by the nuclear power venture in the United States, culminating in the State-of-the-Art Reactor Consequence Analyses (SOARCA) study by the U.S. NRC. MELCOR has most recently supported a range of post-Fukushima regulatory decision-making processes that have advanced the overall safety and economics of nuclear energy in the United States. Originally intended to evaluate how accidents involving the melting of a reactor core progress and potentially release radioactivity to the environment, it has found increased application to characterizing how a range of accidental events, phenomena, and human actions interact over a broad range of length and time scales at a nuclear energy facility to result in conditions that could lead to radiological or hazardous chemical release to the environment. This capability has emerged as an important component of the U.S. NRC strategy to establish regulatory readiness for the review of advanced nuclear energy technologies. In this talk, we will survey the fundamental contributions that an integral safety analysis code like MELCOR has played in advancing the state-of-knowledge of nuclear energy public health and safety risk, and its role in enabling the emerging frontiers of nuclear energy innovation and modernization in the United States.