3167 San Mateo Blvd NE #131
Albuquerque, NM 87110-1921
http://local.ans.org/trinity/
ans.trinity@yahoo.com

American Nuclear Society
Trinity Section

ZOOM MEETING ANNOUNCEMENT

https://us02web.zoom.us/j/81174370671?pwd=TTUxWW9xSnRzZFZUYytYYzd0OEozdz09

"Lightning Talks #5"

Background: Because of the constraints that the COVID-19 pandemic continues to place on in-person gatherings, Trinity Section is hosting the fifth 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.

This session of lightning talks features presentation by students in the UNM Nuclear Engineering program.

Each of these talks is targeted for about 15 minutes or so, 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, March 23, 2021**

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).

"Gamma-Rays Correlated With Individual Fission Fragments"

Phoenix Baldez,
UNM Nuclear Engineering PhD candidate

Abstract: We previously designed, built, and tested a fission spectrometer to identify individual masses emitted in fission, based on energy-velocity (E-v) correlations for each particle. Using an active cathode configuration in our ionization chamber (IC) to determine range fragments, we are able to extract Z information for each particle. We are working to couple time-of-flight (ToF) and IC that makes up the E-v spectrometer with gamma-ray detectors. Gamma-rays detected near the target gives us prompt gamma-rays correlated with a fission event and correlated with individual identified fragment production. While gamma-rays detected near the IC gives us gamma-ray data from >50 ns to possibly ms following fission, correlated with individual identified fragments. This amount of highly correlated data will allow us to obtain very clean gamma-ray spectra of the fission products while also identifying Z and A of fission fragments to a high degree of accuracy.

"A Review of Windowed Multipole: A Novel Nuclear Data Formalism"

Matthew Lazaric,
UNM Nuclear Engineering PhD candidate

Abstract: This study provides a review of the windowed multipole nuclear data formalism and its potential to develop on-the-fly Doppler broadening and resonance parameter sensitivities. The R-matrix method of resonance parametrization is described and is contrasted with the alternative windowed multipole representation. The key advantages of windowed multipole will then be highlighted with a particular focus on developing resonance parameter sensitivities.

"Revisiting the Lockwood Albedo Measurements for Validation of the Integrated TIGER Series Electron-Photon Transport Code"

Rowdy Davis,
UNM Nuclear Engineering PhD candidate

Abstract: The Integrated TIGER Series (ITS) of coupled electron/photon Monte Carlo radiation transport codes are validated weekly against a variety of experimental measurements. However, recent analysis of the validation suite has drawn attention to its deficiencies: few number of overall tests, sparse coverage of target materials and source energies, poor quantification of uncertainties and lack of quantitative comparison metrics. To update the validation suite, we have chosen a set of measurements with relatively simple geometry, the Lockwood albedo suite, which allowed us to apply two error metrics (error relative to the measurement and error to the combined statistical deviation) to compare ITS simulations with the Lockwood measurements. As a result, we found that 90% of the comparisons were within ±5% relative error which most of our stakeholders would readily accept. However only 75% of these measurements were within two standard deviations of the combined aleatoric uncertainties, suggesting some systematic bias in the results, though it does not identify whether this is in the measurements or simulations, or in quantifying the uncertainties in either. These findings have demonstrated a methodology that is useful going forward for future investigations to build evidence for the predictive simulation capability of ITS.