INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT
UNIVERSITY OF FLORIDA STUDENT CHAPTER
2/1/2017

The INMM University of Florida Student Chapter Executive Committee members are the following:

Office		**Term Ending**
President	Paul Johns	8/22/2017
Vice President	Gabriel Sandler	8/22/2017
Secretary	Hannah Gardiner	8/22/2017
Treasurer	Noah McFerran	8/22/2017
Member-at-Large	Enrique Wong	8/22/2017
Member-at-Large	Nicolas Silva	8/22/2017
Member-at-Large	Haitang Wang	8/22/2017
Immediate Past President	Robert Weinmann-Smith	

Activities

Activities over the past six months have focused on a graduate student seminar series run by the chapter. Over the fall semester, three senior graduate students presented their research to the students and faculty of the UF Nuclear Engineering Program. Flyers made for the events with the abstracts and biographies of the speakers are attached at the end of this document. At these meetings, food and drink were provided by UF student government funding obtained for the chapter. In the spring, we plan to continue and extend the frequency of the seminar series.

Apart from the seminar series, a meet-and-greet with Dr. Lindsay Sexton of Savannah River National Lab was held by the chapter. During the meet-and-greet, students were able to get professional advice on their career choices and learn about SRNL's mobile plutonium facility. In addition, because Dr. Sexton is the chair of the INMM Southeast Section, meeting with her was a great way to build the relationship between the two chapters. One of the takeaways from the talk was plans for SRNL to provide the chapter with a list of subject matter experts to invite for seminars, as well as the potential for the chapter receive funding to assist in paying speakers to fly out.

A major goal for the chapter is to provide funding for INMM student members to attend the 58th Annual Meeting in July. The chapter aims to accomplish this by obtaining funding from the UF Materials Science and Engineering Department, under which we are a student organization. We anticipate up to $400 will be obtained to aid in sending one to two students to Indian Wells, CA for the conference.

Respectfully Submitted:
Paul Johns

Treasurer's Report

FY2016 FINAL

UF Student Chapter Financial Statement – 6/20/2016 – 2/1/2017

	Income	Expenses	Notes
	$92	$92	
Chapter Balance: 6/20/2016			
Income: $80			
UF Student Gov't funding	92		
Income Total: $80			
Expenses: $80			
Food and drink for seminars		92	
Expenses Total: $80			
Chapter Balance: $0 2/1/2017			

Student Seminar Series Fall 2016 – 4:00 pm on 11/18, Rhines Hall 125

Computed Tomography of Dry Cask Storage

Presented by Christopher Greulich

Since the U.S.A currently only approves of storing used nuclear fuel in pools or dry casks, the demand for dry cask storage is on the rise due to the continuous operation of currently existing nuclear plants which are reaching or have reached the capacity of their used fuel pools. With the raising demand comes additional pressure to ensure the integrity of the dry cask system and the fuel inside. Currently the best method is to do visual inspection, and as the NRC only allows handling of used special nuclear materials while fully submerged, this represents a tremendous cost to the utility in time, labor, and money. Therefore, alternative nondestructive testing techniques are desired to insure the continued safe and effective storage of fuel. Investigation into a gamma or neutron based computed tomography systems are underway. Computed tomography systems can be roughly divided into two categories both of which are being investigated: active transmission systems or passive source emission systems. Long standing medical imaging techniques have been developed for computed tomography and they will be leveraged as the systems are retooled and analyzed to meet the challenges of used fuel verification.

Christopher Greulich graduated with a Bachelors in Nuclear Engineering from the University of Florida in December 2014, and his Masters in December 2015. He has worked two summers at Pacific Northwest National Laboratory on advance detector design, development, simulation, and testing. He was awarded a NEUP fellowship and is pursuing his Ph.D. in Nuclear Engineering under Dr. James Baciak. His current research involves simulating used nuclear fuel in dry cask storage and developing computed tomography systems in order to peer inside the cask without exposing the fuel.

Reducing Systematic Error in Neutron Multiplicity Counting

Presented by Robert Weinmann-Smith

Non-Destructive Assay is commonly used by organizations such as the International Atomic Energy Agency to verify compliance with the Non-Proliferation Treaty (NPT). One method of NDA is neutron multiplicity counting. Neutron multiplicity counting has been studied for decades and is used to quantify the amount of material present in complex samples. Still, there are applications of the technique that require improved understanding and tools. This work focuses on improvements to the physics knowledge, detection tools, simulation tools, and environmental background knowledge, of neutron multiplicity counting. An overview of multiplicity counting will be presented. The background effects of cosmic rays on neutron multiplicity counting were simulated and measured. Again through measurement and simulation, the variation in AmLi neutron source spectra and its effects on multiplicity counting were shown. New AmLi spectra were generated through simulation that best fit the measurements. Finally, the potential effect of upcoming improvements to the fission model in MCNP6.2 will be discussed.

Robby Weinmann-Smith is a graduate student at the University of Florida. He received a BSc. in nuclear engineering in 2014 and a MSc. in 2016 both from UF. He spent the summers of 2014 and 2015 at Los Alamos National Laboratory working on simulations and experiments of neutron multiplicity counters in the safeguards science and technology group NEN-1. He is now at NEN-1 full time working on his dissertation titled ‘Reducing Systematic Error in Neutron Multiplicity Counting’ with an expected completion date of 2018.

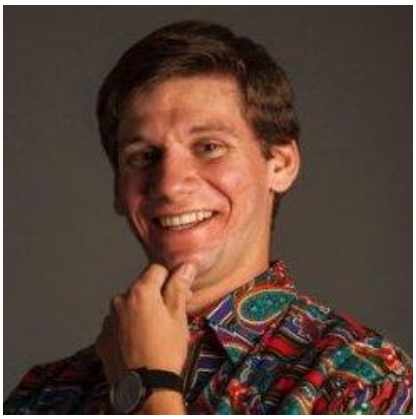
Student Seminar Series Fall 2016

Simulating Reactor Transient Experiments with T-ReX and KENO-VI

Presented by Zander Mausolff

The accident at the Fukushima-Daiichi power plant has renewed interest within the United States for the development of nuclear fuels with enhanced accident tolerance. Development and evaluation of new fuels is scheduled at Idaho National Laboratory's Transient Reactor Test Facility (TREAT). Previous fuel testing with TREAT required a number of costly pre-test calibration experiments. To minimize the number of pre-test experiments required, we hope to optimize the pre-test vessel through simulation. Simulating TREAT from first-principles pose several modeling challenges due to the non-uniform insertion of reactivity from transient rods and a unique core geometry. To aid in this effort the geometric capabilities of the code referred to as the Transient Reactor eXperiment simulator (T-ReX) has been modified to incorporate the Monte Carlo code KENO-VI in its calculation sequence. Previously, T-ReX relied on KENO V.a, which only supports simple geometry inputs. T-ReX provides advantages over typical codes by solving the three-dimensional time dependent transport equation with delayed neutrons with the Improved Quasi-Static method, which makes minimal physical approximations. Newly added capabilities in T-ReX are verified through comparison to computational benchmark and sample problems. Finally, TREAT temperature-limited transient experiments are simulated with both KENO V.a and KENO-VI models. Simulations with KENO-VI models resulted in improved agreement between calculated T-ReX values and experiment over KENO V.a models.

Zander is a second-year graduate student pursuing a PhD at the University of Florida. He graduated with a B.S. in Physics and a minor in Mathematics from the University of San Francisco in 2014. At USF he complete an Undergraduate Thesis on Frequency Modulation Spectroscopy. He recently was awarded a NEUP Fellowship for work relating to the development of time-dependent neutron transport codes for transient analysis. Recent work has focused on multi-physics modeling of TREAT at the INL to support in its restart. As a graduate student for the GAMeS Lab at UF he mentors several undergraduates as part of the UF research mentorship program.



Apart from research he is highly active in ANS. Currently he is the President of the Student Chapter of ANS at UF. Additionally, he is the student program chair for the NETS meeting in 2017, and the student program chair for the 2018 National Conference in San Francisco. Apart from that he received the Nuclear Criticality Pioneers Scholarship for 2016.

When not pursuing academic endeavors Zander enjoys skateboarding, skiing, playing soccer, and fixing cars. He is particularly interested in decentralized computing platforms such as bitcoin, Ethereum and how they may disrupt the status quo of banking, information technology, and the distribution of nuclear data.