



### **SIMON PHILLPOT**

Dr. Phillpot received his Ph.D. in Physics from the University of Florida (UF). He is Director of the Nuclear Engineering Program and Chair of the Department of Materials Science and Engineering. His research focuses on using atomic-level simulation methods to understand the thermal, mechanical, and defect properties of UO<sub>2</sub> and cladding materials.



### **EDWARD DUGAN**

Dr. Dugan returns to the Nuclear Engineering Program at UF in July 2012 as Assistant Program Director after spending two years at NuSAFE, LLC in Oak Ridge, TN where he worked on x-ray backscatter imaging. After 33 years in the Nuclear Engineering Program, Dr. Dugan had retired from UF in June 2010, but his passion in education led him back to UF. His areas of expertise include reactor analysis, nuclear power plant dynamics and control, space nuclear power and propulsion. Other areas of interest include radiation transport, Monte Carlo simulations, radiographic imaging techniques applied to non-destructive examination, and backscatter x-ray imaging.



### **JAMES BACIAK**

Dr. Baciak received his Ph.D. in Nuclear Engineering from University of Michigan in 2004. He joins UF as Associate Professor after having spent the last 2 years as an engineer at Pacific Northwest National Laboratory (PNNL) in Richland, WA. At PNNL, he supported research in a number of projects related to national security and arms control. His research at PNNL has included applied aspects of cargo monitoring, detector testing and characterization for gamma-ray spectroscopy, as well as development and analysis of techniques for environmental sampling and surveys related to on-site inspections, all of which he hopes to further pursue at UF.



### **WESLEY BOLCH**

Dr. Bolch graduated from UF with a Ph.D in Radiological Health Physics and has been very involved in the Nuclear Engineering Program and Biomedical Engineering Program at UF. His research interests include external and internal radiation dosimetry, computational medical physics, and development of patient-specific anatomic models for organ dose assessment in radiology and radiation therapy, skeletal dosimetry, and emergency response to radiological terrorism.



### **DAVID GILLAND**

Dr. Gilland received his Ph.D in Biomedical Engineering from the University of North Carolina in 1989. His research interests include medical imaging, nuclear medicine imaging, single photon emission computed tomography (SPECT), positron emission tomography (PET), medical image processing, image reconstruction from projections, and medical image evaluation using receiver operating characteristic (ROC) analysis.



### **SEDAT GOLUOGLU**

Dr. Goluoglu received his Ph.D. in Nuclear Engineering from the University of Tennessee, Knoxville in 1997. He joins UF as Professor after a long career at Oak Ridge National Laboratory (ORNL) as a research scientist in the areas of reactor physics and criticality safety. His areas of expertise and interest include advanced modeling and simulation, reactor physics applications and methods development, radiation shielding methods development, nuclear criticality safety analyses and methods development, neutron and gamma cross section data processing methods and tools, sensitivity and uncertainty analyses and methods development, as well as methods and code development for static and time-dependent neutron transport.



### **DAVID E. HINTENLANG**

Dr. Hintenlang graduated from Brown University in 1985 with a Ph.D. in Physics. His DOE-funded research efforts focus on the development of techniques to accurately measure radiation organ doses from clinical procedures through the fabrication of detailed anthropomorphic phantoms and advanced dosimeters.



### **KELLY JORDAN**

Dr. Jordan graduated with a Ph.D. in Nuclear Engineering from UC Berkeley in 2006. He joined UF in 2011 as Assistant Professor and Director of the University of Florida Training Reactor (UFTR). Dr. Jordan's research areas include experimental reactor physics, radiation detection, and advanced measurement techniques for safeguards and nonproliferation. He is also working towards a combined delayed neutron-delayed gamma method for low-uncertainty measurements of induced fission rates in nuclear fuel. Dr. Jordan's teaching interests include reactor physics, neutronics, and Monte Carlo methods for radiation transport.



### **DUWAYNE SCHUBRING**

Dr. Schubring graduated from University of Wisconsin-Madison in 2009 with a Ph.D. in Nuclear Engineering and Engineering Physics. He is an Assistant Professor of Mechanical and Aerospace Engineering and a member of the Nuclear Engineering Program at UF. His research interest includes nuclear reactor thermal hydraulics, two-phase (gas-liquid) flow, and quantitative visualization. He is the principal investigator of VICTR (Visualization, Imaging, and Computation of Thermohydraulics for Reactors) Lab and he is also the faculty adviser of the UF ANS student chapter.



### **JAMES TULENKO**

Prof. Tulenko is Professor Emeritus in Nuclear Engineering at the University of Florida and also the Director of the Laboratory for Development of Advanced Nuclear Fuels and Materials. He was Chairman of the Department of Nuclear and Radiological Engineering at UF for sixteen years and a former President of the American Nuclear Society (ANS). Prof. Tulenko's research and interests include nuclear fuel cycle, radioactive wastes, reactor analysis, and engineering application of radioisotopes, robotics, intelligent databases, and system analysis.



### **YONG YANG**

Dr. Yang graduated from University of Wisconsin, Madison in 2005. His research interests are mainly focused on the structural and fuels materials for nuclear energy systems, and his expertise is centered on the radiation damage, corrosion prevention and advanced joint and fabrication technologies. The current research directions include ageing management for the LWR lifetime extension, long-term dry storage of spent nuclear fuels, novel coating on the inner-surface of cladding tubes, and pulsed magnetic welding on advanced cladding steels.



### **KATHERIN GOLUOGLU**

Ms. Goluoglu graduated from University of Tennessee, Knoxville with a M.S. in Nuclear Engineering in 2004. Her area of expertise and primary interest is nuclear criticality safety. She is also interested in and has experience with shielding and source term applications as well as computer code development and testing. She has served as the Nuclear Criticality Safety staff to both reactor and research facilities, covering a wide range of activities from radioactive materials transportation to spent fuel pool safety.



### **JOSEPH MACK**

Dr. Mack's technical interests spanning the past 35 years include experience in nuclear explosive diagnostics, the development and application of Monte Carlo transport methods, and understanding plasma physics relevant to magnetic and laser fusion.



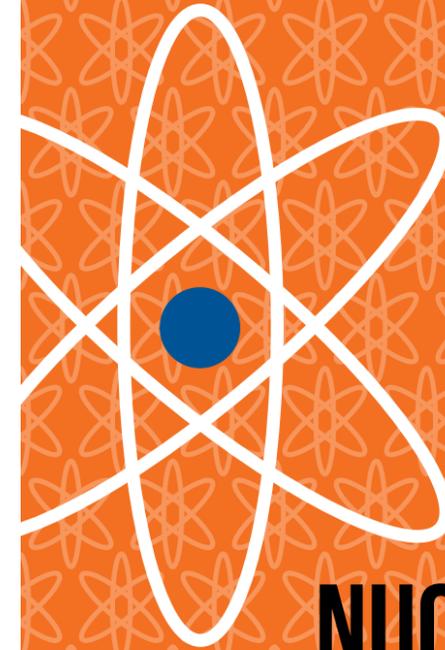
### **PINGCHIEN NEO**

Ms. Neo received her M.S. in Nuclear Engineering from ETH Zürich. Prior to joining the Nuclear Engineering program at UF, she was a nuclear safety engineer in the probabilistic safety analysis (PSA) group at Leibstadt Nuclear Power Plant (KKL) in Switzerland. Her interests and areas of expertise include probabilistic safety analysis, radiation detection as well as nuclear safeguards and nonproliferation.



### **WILLIAM VERNETSON**

Dr. Vernetson was previously the Director of the UF Training Reactor (UFTR) for 23 years and has been a member of the teaching faculty at UF for 32 years. He retired from UF in 2008 but continues to bring his years of experience to teaching courses in reactor safety, power and non-power reactor operations and training, systems design and probabilistic safety assessment, criticality analysis, and neutron activation analysis. Dr. Vernetson also has extensive experience in nuclear industry consulting, including in the areas of training and education.



# **NUCLEAR ENGINEERING PROGRAM**

*Fall 2012*

**UF** UNIVERSITY of FLORIDA



UF Nuclear Engineering students participated in the Safeguards Laboratory at Oak Ridge National Lab (ORNL) in March 2012. The Safeguards Lab provided students with hands-on training on international verification regimes in support of nuclear nonproliferation programs.

## PROGRAM DESCRIPTION

The Nuclear Engineering (NE) program was established to contribute to research and education for the application of nuclear science and engineering. Within the Department of Materials Science and Engineering (MSE), the Nuclear Engineering program is a discipline with various applications including homeland security, power generation, radiation transport methods, nondestructive imaging and detection, advanced nuclear materials, nuclear reactor thermal hydraulics, as well as nuclear safeguards and nonproliferation.

Many diverse opportunities await graduates of the NE program as nuclear science and engineering continue to make major contributions to electricity production, medical diagnostic imaging and therapy, non-destructive testing as well as radiation detection and measurement. These opportunities will continue to grow as we face more challenges in energy production and the expanded use of nuclear technology.

The curriculum covers a variety of subjects including radiation interactions, particle diffusion and transport, reactor physics, thermal hydraulics, fuel cycle and waste management, risk assessment, and radiation protection and dosimetry. To advance the use of nuclear science and engineering, the NE faculty have been involved in cutting edge research in many different areas including high performance computing, advanced reactor design, and fuels for space nuclear power and propulsion, particle transport methods and their application for simulation of real-life nuclear systems, reactor physics, advanced nuclear fuel design, and nondestructive testing and detection.

The Nuclear Engineering Program at the University of Florida strives to attract and develop an outstanding and diverse faculty, student body and staff as well as to provide the best undergraduate and graduate education in nuclear engineering.

## DEPARTMENT OF ENERGY AWARDS UF \$800,000 TO IMPROVE NUCLEAR POWER SAFETY

The Nuclear Engineering Program in the University of Florida's Department of Materials Science and Engineering was recently awarded an \$800,000 contract by the U.S. Department of Energy (DOE) as part of DOE's ongoing commitment to support university-led nuclear research and development. The DOE is awarding a total of \$19.9 million in fuel cycle research and development in 32 U.S. universities and colleges, including the UF College of Engineering.

"This award recognizes the outstanding research that is being conducted at the University of Florida's Laboratory for Development of Advanced Nuclear Fuels and materials," said James S. Tulenko, Professor Emeritus in the Nuclear Engineering Program and principal investigator on the contract. "We aim to make strides in making nuclear fuel a safer and more efficient energy source for America and the world."

Tulenko is an expert in nuclear fuel processing and performance, engineering application of radioisotopes, nuclear fuel cycle economics, radioactive wastes, reactor analysis and system analysis. His team will study the use of diamond nanoparticles composite material on fuel pellets to improve the thermal conductivity of the nuclear fuel resulting in reduced fuel temperatures, fuel thermal expansion, thermal cracking and fission gas releases to produce a better performing, higher burn-up, and more accident tolerant fuel.



*"This grant recognizes the outstanding research which is being conducted at the University of Florida's Laboratory for Development of Advanced Nuclear Fuels and materials."*

James S. Tulenko, Professor Emeritus

## UF NUCLEAR ENGINEERING PROGRAM GETS NEW SAFETY EQUIPMENT AND INSTRUMENTATION TRAINING AWARD

KELLY JORDAN, Assistant Professor in the Nuclear Engineering Program at the University of Florida was recently awarded a grant worth more than \$167,000 by the Department of Energy (DOE) to help upgrade the UF Training Reactor (UFTR). As part of the DOE's Nuclear Energy University Programs (NEUP) Infrastructure Award totaling \$6 million, the grant allows for Jordan, who is also the director of UFTR, to use a new air monitoring system that includes an online



Ar-41 monitoring system. The new Canberra CAM110G Series Continuous Air Monitor will provide for online Ar-41 effluent monitoring, as part of the UFTR modernization efforts, including planned digital control and safety system upgrades. This integration of waste monitoring and system upgrade is expected to provide real time data report of releases as well as digital control and instrumentation training for research and teaching purposes for faculty and students while significantly improving reactor safety.

In addition, three undergraduate students from the program have been awarded with a NEUP scholarship from DOE. The students are among the 39 undergraduates nationwide who will receive \$5,000 each to support their study in the nuclear field. The scholarships are part of the DOE's ongoing commitment towards training and educating the next generation of nuclear energy leaders.

With these awards and another \$800,000 NEUP fuel cycle research contract received by the UF Laboratory for Development of Advanced Nuclear Fuels and materials, UF Nuclear Engineering faculty and students have unparalleled exposure to the latest reactor technologies to help support the nation in the implementation of next generation nuclear energy needs.