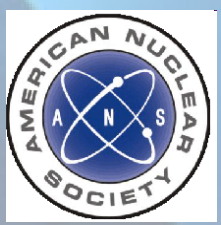
Nuclear Science and Engineering Education Sourcebook 2013

American Nuclear Society
US Department of Energy



Nuclear Science & Engineering Education Sourcebook 2013

North American Edition

American Nuclear Society
Education, Training, and Workforce Division

US Department of Energy
Office of Nuclear Energy

Editor and Founder
John Gilligan
Professor of Nuclear Engineering
North Carolina State University

Version 5.13

Welcome to the 2013 Edition of the Nuclear Science and Engineering Education (NS&EE) Sourcebook. We have evolved and improved! The core mission of the Sourcebook has not changed, however. Our purpose is to facilitate interaction among faculty, students, industry, and government agencies to accomplish nuclear research, teaching and service activities. Since 1986 we have compiled critical information on nuclear engineering enrollments, degrees, and faculty expertise in printed and electronic formats.

With the expansion of nuclear energy activities since our last edition in 2011, we will now include select science faculty and programs that are relevant to nuclear energy production and use. For example this includes radiochemistry programs focused on nuclear fuel cycle problems. Hence, the expansion of our title includes "Science".

We have gone to a new web based input format that allows quick changes (updated twice per year) to the Sourcebook and the capability to do ranking and sort manipulations in a spreadsheet environment as the data is displayed. We will publish a PDF version of the Sourcebook. This year we will also include programs that are new and growing, which might include undergraduate curricula with a nuclear energy minor or graduate programs that offer a track or certificate option. We will list only faculty involved in the nuclear options in all of these cases. In general we list faculty that have at least a budgeted 25% appointment in nuclear activities.

Other nuclear energy or related programs can be found under the listings for the ANS Student Branches and University Reactors. The Sourcebook data will be placed on the web at the Nuclear Energy University Programs (NEUP) site at the Idaho National Laboratory. Copies of the Sourcebook will be distributed to academic Department Heads, and libraries, as well as key industry, society and government officials. A limited number of extra printed copies can be requested in cases where web access is limited or inconvenient.

The Sourcebook is a publication by the Education, Training and Workforce Division of the American Nuclear Society with the support of the Department of Energy, Office of Nuclear Energy. Appreciation is expressed to the Executive Committee of the ETWD of the ANS for their encouragement for this project. Special thanks go to the NEUP Integration Office at the Idaho National Lab for providing support and a web site home for the NS&EE Sourcebook. We would also like to acknowledge the diligent work of Ms. Sherry Bailey for accumulating the Sourcebook information and for maintenance of the Sourcebook website.

We are excited to present the 2013 Edition of the NS&EE Sourcebook (Version 5.13) available in PDF file format and on the web at www.neup.gov .

To update information, please contact Ms. Sherry Bailey (sbbailey@ncsu.edu or 919-515-1897).

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Table of Contents	

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	18	17	14	13	14
Masters	10	14	9	14	8
PhD	7	13	5	5	10

Graduate Student Enrollment: 8 Masters/67 Ph.D.
ABET Accreditation: BS degree in Nuclear Engineering

Nuclear Science and Engineering Faculty

Karl Van Bibber, Professor and Chair (510-642-3477) [karl.van.bibber@nuc.berkeley.edu] Ph.D. Massachusetts Institute of Technology, 1976. Nuclear Physics; Particle Physics; Particle Astrophysics; Nuclear Instrumentation; Accelerator Science & Technology.
Website: www.nuc.berkeley.edu/People/Karl_Van_Bibber

Joonhong Ahn, Professor (510-642-5107) [ahn@nuc.berkeley.edu] Ph.D., UC Berkeley**,** 1988**.** Mathematical analyses of radionuclide transport in heterogeneous geologic formations and of radionuclide release from man-made waste disposal systems; overall performance assessment models and analysis of the nature of uncertainty incorporated in long-term assessments for radioactive waste disposal. Website: http://www.nuc.berkeley.edu/People/Joonhong_Ahn

Peter Hosemann, Assistant Professor (510-642-5341) [peterh@berkeley.edu] Dr.**,** Montanuniversitaet Leoben, Austria**,** 2008. Small scale materials testing on irradiated and unirradiated structural materials for nuclear applications; Investigating new advanced structural materials concepts (e.g. oxide dispersion strengthened steels) for nuclear applications using accelerated materials testing via ion beam irradiations; Liquid metal corrosion of structural materials for nuclear applications.
Website: http://www.nuc.berkeley.edu/People/Peter_Hosemann

Edward C. Morse, Professor (510-642-7275) [morse@nuc.berkeley.edu]
Ph.D., University of Illinois, Urbana-Champaign, 1979. Fusion reactor design and applied plasma physics, experimental investigation of RF plasma heating; rotating target neutron source at UC Berkeley; experimental studies of compact toroids; a spectral method for magnetohydrodynamic stability. Website: http://www.nuc.berkeley.edu/People/Edward_Morse

Eric B. Norman, Professor (510-643-9984) [ebnorman@lbl.gov] Ph.D.**,** University of Chicago**,** 1978**.** Developing active neutron-based interrogation system to screen sea-going cargo containers for fissionable material; Cryogenic Underground Observatory for Rare Events (CUORE) – a planned large-scale bolometric detector designed to search for the neutrinoless double beta decay of 130Te; Measurements of neutron and charged-particle induced reaction cross sections for homeland security, nuclear astrophysics, and neutrino physics.
Website: http://www.nuc.berkeley.edu/People/Eric_Norman

Donald R. Olander, Professor in the Graduate School (510-642-7055) [fuelpr@nuc.berkeley.edu] Sc.D.**,** MIT**,** 1958. High-temperature kinetic and thermodynamic behavior of nuclear reactor fuels; performance of degraded nuclear fuels.
Website: http://www.nuc.berkeley.edu/People/Donald_Olander

Per F. Peterson, William and Jean McCallum Floyd Endowed Chair (510-642-7749) [peterson@nuc.berkeley.edu] Ph.D., UC Berkeley, 1988. High-temperature fission and fusion energy systems; topics related to the safety and security of nuclear materials and waste management: heat transfer; fluid mechanics; regulation and licensing for high temperature reactors, principally designs that use liquid fluoride salts as coolants. Website: http://www.nuc.berkeley.edu/People/Per_Peterson

Stanley G. Prussin, Professor in the Graduate School (510-642-5274) [prussin@berkeley.edu] Ph.D., University of Michigan**,** 1964. Low energy nuclear physics and the use of nuclear methods and instrumentation for solving applied problems: oxidation of spent nuclear fuel; radial dependence of burnup and actinide production in irradiated UO2; radiation safety inlarge central radiopharmacies; development of a nuclear medicine procedure for breast cancer; benchmark measurements of delayed fission product gamma rays; investigation of delayed fission gamma rays as a robust signature for nuclear materials in sea-going cargo containers.
Website: http://www.nuc.berkeley.edu/People/Stanley_Prussin

Jasmina L. Vujic, Professor (510-642-8085) [vujic@nuc.berkeley.edu] Ph.D., University of Michigan, 1990. Numerical methods in reactor physics, neutron and photon transport, reactor core design and analysis, shielding and radiation protection, biomedical application of radiation, optimization techniques for vector and parallel computers: neutronics analysis of fissile material behavior in geologic repositories; computer modeling for radiation diagnostic and cancer therapy; development of multiprocessor multiassembly neutron transport theory code; development and validation of the GT-SCALE code package for advanced reactor core designs; development of a unified multidimensional computational method for neutral particles in complex non-uniform domains.
Website: http://www.nuc.berkeley.edu/People/Jasmina_Vujic

Other Faculty

Ehud Greenspan, Professor in Residence (510-643-9983) [gehud@nuc.berkeley.edu] Ph.D., Cornell University, 1966. Generation IV reactors - conception and analysis of advanced nuclear reactors; Transmutation - minimization of nuclear waste as well as the disposition of nuclear waste and the closing of the nuclear fuel cycle; Advanced fuel cycles for improving proliferation resistance and nuclear fuel utilization; as well as development of automated nuclear design optimization methods and their application in the areas of criticality safety, boron neutron capture therapy, radiation shields, and fusion energy systems. Website: http://www.nuc.berkeley.edu/People/Ehud_Greenspan

Daniel M. Kammen, Professor (510-643-2243) [kammen@socrates.berkeley.edu]
Ph.D., Princeton University, 1988. Science and technology policy focused on energy, development and environmental management; Technology and policy questions in developing nations, particularly involving: the linkages between energy, health, and the environment; technology transfer and diffusion; household energy management; renewable energy; women; minority groups; Global environmental change including deep cuts in greenhouse gas emissions and resource consumption; Environmental and technological risk; Management of innovation and energy R&D policy. Geographic expertise: Africa; Latin America. Website: http://www.nuc.berkeley.edu/People/Daniel_Kammen

William E. Kastenberg, Professor Emeritus (510-643-0574) [kastenbe@nuc.berkeley.edu] Ph.D., UC Berkeley, 1966. Ethical issues in emerging technologies, risk assessment and risk management for technological and natural complex systems, nuclear reactor safety, environmental risk analysis, environmental conflict resolution. Website: http://www.nuc.berkeley.edu/People/Bill_Kastenberg

Ka-Ngo Leung, Professor in Residence (510-486-7918) [knleung@lbl.gov] Ph.D., UCLA, 1975. Plasma and Ion Beam technology in microfabrication processes: maskless ion beam lithography technology as candidates for next generation lithography (NGL) that will be used to produce feature sizes of 100 nm and below; focused ion beam (FIB) systems equipped with plasma ion sources; compact neutron tube with rf plasma ion source. Website: http://www.nuc.berkeley.edu/People/Ka-Ngo_Leung

John P. Verboncoeur, Visiting Professor (510-642-3477) [johnv@nuc.berkeley.edu]
Ph.D., UC Berkeley, 1992. Computational plasma physics, treating collisional and collisionless plasmas as well as bounded plasmas, both electrostatic and electromagnetic: high temperature plasmas such as hot fusion; low temperature discharges for lighting and materials processing; electron and ion beams for heavy ion fusion, propulsion, accelerators, and lithography; microwave beam devices for plasma heating, radar, and electronic warfare; basic plasma physics, including instabilities and plasma-surface interactions; numerical methods. Website: http://www.nuc.berkeley.edu/People/John_Verboncoeur

Kai Vetter, Associate Professor in Residence (510-642-7071) **[**kvetter@nuc.berkeley.edu] Ph.D., J. W. Goethe-University, Frankfurt**,** 1995. Development and demonstration of new and/or improved gamma-ray (and neutron) imaging concepts for applications ranging from homeland security and nuclear non-proliferation tobiomedicalimaging; search for neutrino-less double-beta decay in 76Ge to obtain better understanding on fundamental properties of neutrinos to answer fundamental questions; developing and demonstrating new and improved concepts in Ge detector technologies to provide unprecedented

capabilities in observing rare decays or rare interactions; basic nuclear physics experiments and associated instrumentation to better understand the basic structure of nuclei.
Website: http://www.nuc.berkeley.edu/People/Kai_Vetter

Brian D. Wirth, Visiting Professor (510-642-5341) [bdwirth@nuc.berkeleuy.edu]
Ph.D., UC Santa Barbara, 1998. Multiscale materials dynamics: radiation effects on materials in nuclear fission and fusion energy environments, high strain rate deformation and the fundamental relationships between microstructure evolution and mechanical behavior.
Website: http://www.nuc.berkeley.edu/People/Brian_Wirth

Nuclear Science and Engineering Research Centers

Nuclear Science and Security Consortium (NSSC): The NSSC is a consortium of seven major research universities and five DOE national laboratories, of which UC Berkeley is the lead institution. Funded by the DOE Office of Non-Proliferation ($25M/5 years), the purpose of the NSSC is to reinvigorate the pipeline of scientific, engineering and policy talent into the national laboratories and federal service in national security. Primarily the Consortium is intended to fund undergraduate, graduate student and postdoctoral research, introducing and connecting this talent with participating DOE labs. The NSSC supports research across the entire spectrum of relevant disciplines, including nuclear and particle physics, nuclear instrumentation and radiation detection, nuclear- and radiochemistry, nuclear engineering, and nuclear security international policy and programs. Additionally, NA-22 has expanded and augmented the program to include solicitations for research grants and internships to Minority Serving Institutions (MSI) as well.

Berkeley Nuclear Research Center (BNRC): The principal focus of the center is to address critical sustainability issues for the nuclear fuel cycle with the specific objectives of: enabling human capital Development for the next generation of nuclear scientists and engineers; creating knowledge and information to inform national policy decisions; fostering international collaborations; fostering campus - national laboratory collaborations; attracting resources and building R&D capabilities.

Applied Nuclear Physics Laboratories: These labs are concerned with the low-energy nuclear physics and interaction of radiation with matter important to nuclear chemistry, nuclear technology and applications. Research programs include fundamental nuclear physics measurements for applied purposes and the development of advanced detectors and methodologies, in addition to the application of nuclear techniques in a wide range of studies. Current emphasis is on experimental and modeling studies in support of neutrino mass measurements, the design of methodologies and systems to counter the possible transport of clandestine nuclear materials and applications in the biomedical and radiological sciences.

Nuclear Materials Laboratory: This lab uses thermogravimetric techniques with microbalances to investigate the hydriding and oxidation of nuclear reactor core materials and positron annihilation spectroscopy to characterize the microstructural changes in irradiated structural steels. In addition to understanding the performance of nuclear fuels and materials in current nuclear fission plants, the materials aspects of new fuel element designs and advanced nuclear fuels and structural material

systems are investigated. The lab is devoted to understanding the many causes of materials degradation and failure in nuclear technology. Specific emphasis is on the behavior of nuclear fuels, cladding and structural materials in nuclear fission and fusion environments where radiation damage and corrosion are the overarching concerns. This research combines computational, experimental and theoretical techniques to investigate the dynamic response of nuclear materials.

Nuclear Waste and Fuel Cycle Laboratory: The lab focuses on performance assessment of nuclear and radioactive waste management. Research topics include (1) mass-flow analyses in the nuclear fuel cycle to quantify compositions and quantities of wastes from various concepts of fuel cycles, ranging from reactors, separation processes, and waste stabilization processes, (2) performance assessment of geological disposal for various different waste forms and repository concepts and designs, ranging from shallow-land burial for low and intermediate level wastes, mined repository for spent nuclear fuels and high-level wastes, and most recently deep borehole disposal for separated long-lived iodine, and (3) development of integrated performance assessment systems covering both the fuel cycle and the geological disposal. After the Fukushima accident, the criticality safety for geological disposal of molten corium and accumulated plutonium has emerged as an important topic.

Renewable and Appropriate Energy Laboratory (RAEL): RAEL is a unique new research, development, project implementation, and community outreach facility that focuses on designing, testing, and disseminating renewable and appropriate energy systems. The laboratory's mission is to help these technologies realize their full potential to contribute to environmentally sustainable development in both industrialized and developing nations while also addressing the cultural context and range of potential social impacts of any new technology or resource management system. The work in RAEL is guided by the principles of use-inspired basic research, interdisciplinary approaches to the needs that energy services can provide, and a dedication to understanding and addressing the opportunities and risks in the implementation of novel energy generation and management programs. At one level, the goal for RAEL is to update, integrate and nurture a collaborative synthesis of E. F. Schumacher's Small is Beautiful appropriate technology and development philosophy with the energy industry as it exists today. On another level, it is to promote sustainable development that includes deep cuts in greenhouse gas emissions and resource consumption. RAEL studies how to evolve the current energy infrastructure through analysis of coal, oil, and integrated fossil-fuel/fuel cells systems, biomass energy, and combinations of energy-efficiency and renewables, as well as entirely new long-term energy options for industrialized, decentralized, and rural energy needs.

Thermal Hydraulics Laboratory: The UCB Thermal Hydraulics Laboratory studies heat transfer and fluid mechanics phenomena that are relevant to fission and fusion energy systems. A principal focus of the laboratory is on the development of and experimental validation of models for passive safety systems. Experimental work in the laboratory has investigated effects of noncondensables on condensation in passive light water reactor containments, large-scale mixing processes in reactor containments and high level waste tanks, coolant fluid mechanics for inertial fusion energy chambers, convective heat transport for high Prandtl number fluids simulating the behavior of fluoride salts, pebble bed granular flows, and other phenomena. The laboratory has extensive capabilities for quality assurance, instrumentation and data acquisition, and modeling and simulation.

Advanced Gamma-Ray Imaging and Image Fusion Lab
Domestic Nuclear Threats Security (DoNuTS) Pelletron
Neutron Detection and Imaging Lab
Nuclear Instrumentation Test Facility
Radiation Detection Teaching and Research Lab
Berkeley Radiological Monitoring Lab and Facility

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	0	0	0	0	0
Masters	0	1	1	4	5
PhD	0	0	0	0	1

Graduate Student Enrollment: 14 Masters/9 Ph.D.

Nuclear Science and Engineering Faculty

Jeffrey C. King, Assistant Professor and Interim Program Chair (303-384-2133) [kingjc@mines.edu] Ph.D., Nuclear Engineering**,** University of New Mexico**,** 2006. Reactor physics and design; neutron imaging; nuclear materials**.** Website: http://www.mines.edu/~kingjc

Cory D. Ahrens, Assistant Professor (303-284-2133)[cahrens@mines.edu] Ph.D., University of Colorado Boulder, 2006. Numerical and analytical methods for radiation transport; multiscale modeling; scientific computing. Website: http://www.mines.edu/~cahrens

Jennifer C. Braley, Assistant Professor (303-273-3996)[jbraley@mines.edu] Ph. D., Washington State University, 2010. Actinide separations; medical radioisotope production; environmental chemistry; nuclear forensics. Website: http://chemistry.mines.edu/faculty/jbraley/jbraley.html

Uwe Greife, Professor and Chair, Management Team, Nuclear Science and Engineering Center (303-273-3618) [ugreife@mines.edu] Dr. rer. nat.**,** Ruhruniversitaet Bochum**,** 1994. Nuclear astrophysics; applied nuclear physics; nuclear fission and fusion; radiation detector development. Website: http://physics.mines.edu/people/phpfiles/greife.php

David Leroy Olson, John H. Moore Distinguished Professor of Physical Metallurgy (303-243-3955) [dolson@mines.edu] Ph.D., Cornell University, 1970.
Actinide metallurgy; liquid metal coolants; material compatibility; beryllium; nuclear joining and casting; QNDT. Professional Engineer.

Other Faculty

Linda Figueroa, Associate Professor (303-273-3491) [lfiguero@mines.edu] Ph.D.**,** University of Colorado at Boulder**,** 1989**.** Bioremediation of radionuclides and metals. Professional Engineer. Website: http://ese.mines.edu/people/faculty/figueroa.html

Jen Schneider, Assistant Professor, Liberal Arts and International Studies (303-273-3628) [jjschnei@mines.edu] Ph.D., Claremont Graduate University, 2004. Science, environmental, and risk communication; engineering education; sustainable community development. Website: http://lais.mines.edu/profiles/schneider.htm

Zeev Shayer, Research Professor (303-273-3037) [zshayer@mines.edu] Ph.D., Tel-Aviv University, Israel, 1985. Advanced fuel cycle and new reactor concept design; thermal hydraulics; radiation physics; dose rate and material degradation assessments; criticality safety analysis; probability risk assessment and reliability analysis; nuclear waste transmutation and compaction; low energy nuclear physics; computational methods in engineering and science. Professional Engineer. Website: http://physics.mines.edu/people/phpfiles/shayer.php

Nuclear Science and Engineering Research Centers

Nuclear Science and Engineering Center (NuSEC) - Coordinates nuclear science and engineering research across campus and maintains the CSM nuclear science and engineering laboratory facilities located adjacent to the GSTR.

Geological Survey TRIGA Reactor (GSTR) - 1 MW thermal TRIGA reactor located on the Denver Federal Center, approximately 10 minutes from campus.

Active Materials Characterization Laboratory (ActMCL) - Provides materials synthesis and characterization capabilities for radioactive materials. Located adjacent to the GSTR. Capabilities include scanning electron microscopy, transmission electron microscopy, optical microscopy, x-ray diffraction, and x-ray nano-computed tomography.

Mines Neutron Radiography (MINER) - Provides neutron radiography capabilities at the GSTR. Capabilities include direct and indirect foil imaging capabilities. The facility can provide a beam flux of $2.2X10^{6}$ n/cm^{2}–s with an effective L/D of approximately 200.

Laboratory for Applied & Environmental Radiochemistry (LAER) – The Laboratory for Applied & Environmental Radiochemistry (LAER) is a multi-user facility that is well equipped for the analysis of radioactive materials. Our emphasis is on understanding the behavior of radionuclides in natural and disturbed environments, and in exploiting the physical and chemical properties of radionuclides for the development of engineered treatment systems. Located on Mines campus. Capabilities include liquid scintillation counting, alpha spectroscopy, and UV-Visible spectroscopy. We also work on the development of the use of radioactive tracers for tagging system components of interest.

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Graduate Student Enrollment: 13 Masters/12 Ph.D
ABET Accreditation: Ph.D., M.Sc.

Nuclear Science and Engineering Faculty

Alain Hébert, Professor **(**514-340-4711 x 4519) [alain.hebert@polymtl.ca] Ph.D., Paris-XI**,** 1980. Reactor Physics; lattice code; neutron diffusion theory. Professional Engineer.

Jean Koclas, Professor **(**514-340-4711 x 4263) [jean.koclas@polymtl.ca] Ph.D.**,** MIT**,** 1980. Safety; reactor kinetics; reactor physics; control and simulation. Professional Engineer.

Guy Marleau, Professor (514-340-4711 x 4204); [guy.marleau@polymtl.ca] Ph.D., McGill University, 1983. Reactor physics, lattice code, neutron transport theory.

Robert Roy, Professor **(**514-340-4711 x 4262) [robert.roy@polymtl.ca] Ph.D., Ecole Polytechnique de Montreal, 1987. Parallel algorithms; high performance computing; design/validation of software for scientific applications. Professional Engineer.

Alberto Teyssedou, Professor **(**514-340-4711 x 4522) [alberto.teyssedou@polymtl.ca]
Ph.D. Ecole Polytechnique de Montreal, 1987. Diphasic flow; thermodynamics; supercritical flows.

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	07/07-06/08	07/08-6/09	7/09-6/10
B.S.	14	23	23
Masters	24	18	13
PhD	8	12	6

Graduate Student Enrollment: 31 Masters/30 Ph.D.
ABET Accreditation: Nuclear Engineering (BS)
CAMPEP Accreditation: Medical Physics (MS & PhD)

Nuclear Science and Engineering Faculty

Simon Phillpot, Professor and Chair (352-846-3782) [sphil@mse.ufl.edu] Ph.D., University of Florida, 1985. Computational materials science; heat transport; nuclear materials; ferroelectrics and dielectrics; mechanical properties of metals; simulation methodologies.

James Baciak, Associate Professor (352-273-2131) [jebacial@ufl.edu] Ph.D., University of Michigan, 2004**.** 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.

Sedat Goluoglu, Professor (352-294-1690) [goluoglu@mse.ufl.edu] Ph. D., University of Tennessee, 1997. Advanced modeling and simulation; criticality safety; neutron and photon cross section processing methods and tools; reactor physics applications and methods development; nuclear materials safeguards and security.

Kelly A. Jordan, Assistant Professor (352-392-1401 x349) [kjordan@mse.ufl.edu] Ph. D., University of California, Berkeley, 2006. Experimental reactor physics, neutronics, Monte Carlo methods for radiation transport, radiation detection, advanced measurement techniques for safeguards and nonproliferation.

Yong Yang Assistant Professor **(**352-392-1401) [yyang@ufl.edu] Ph.D.**,** University of Wisconsin-Madison**,** 2005**.** Structural, fuel cladding and fuel materials for innovative nuclear systems and light

water reactors; all material related issues including radiation damage, evaluation of life extension of existing reactors and material selection for advanced nuclear reactor designs.
Website: www.nre.ufl.edu

Nuclear Science and Engineering Research Centers

Advanced Laboratory for Radiation Dosimetry Studies (ALRADS),: Dr. Wesley Bolch, Director. Performs high performance computing and Monte Carlo simulation for external and internal radiation dosimetry, computational medical physics, utilizing patient-specific anatomic models for organ dose assessment.

Advanced Nuclear Fuel (ANF) Laboratory: Professor James Tulenko. Empirical base evaluation and development of advanced nuclear fuels and related materials.

Particle Transport and Distributed Computing (PTDC) Lab: Dr. Alireza Haghighat, Director. High performance, parallel computing of large scale particle and radiation transport problems.

Progress Energy Advanced Radiation Detection (PE-ARDAD) Lab: Provides an opportunity for undergraduate and graduate students in the department to learn about and operate various radiation detectors, detector systems, and their associated electronics. Other non-destructive testing equipment are also available for investigative/educational purposes.

Radiography by Selective Detection (RSD) of Backscattered X-rays Lab: X-ray backscatter imaging for a wide variety of industrial applications focused on non-destructive testing in aerospace and medical applications.

Visualization, Imaging, and Computation for the Thermohydraulics of Reactors (VICTR): Dr. Duwayne Schubring. Advanced visualizations of annular two-phase flow with planar laser-induced fluorescence (PLIF) and high-speed video and coupled neutronics/TH with 3D neutron transport and 3D computational fluid dynamics.

University of Florida Training Reactor (UFTR): Dr. David Hintenlang, Interim Director. A 100 kW reactor used for training and demonstration, including the design licensing and construction of a fully digital control and safety system.

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	25	32	27	24	22
Masters	25	24	21	4	18
PhD	1	1	8	22	3

Graduate Student Enrollment: 47 Masters/33 Ph.D.
ABET Accreditation: B.S.N.R.E.
CAMPEP Accreditation: M.S.M.P. and Ph.D. NRE – MP option

Distance Education Program
Offers Nuclear Engineering Courses Online
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Nuclear Science and Engineering Faculty

Farzad Rahnema, Professor and Chair of the Nuclear and Radiological Engineering and Medical Physics Programs (404-894-3731) [farzad@gatech.edu]; Ph.D.**,** University of California, Los Angeles**,** 1981. Radiation transport theory; reactor physics; computational medical physics; perturbation and variational methods.

Said I. Abdel-Khalik, Southern Nuclear Distinguished Professor (404-894-3719) [said.abdelkhalik@me.gatech.edu]; Ph.D., University of Wisconsin-Madison, 1973. Reactor thermal-hydraulics; reactor operations; reactor safety; fusion technology.

Laurent Capolungo, Assistant Professor (+1133 3 87 20 39 49) [laurent.capolungo@me.gatech.edu] Ph.D., Georgia Institute of Technology, 2007. Computational material science; multi-scale modeling; materials processing; constitutive laws; and material deformation.

Mohammed Cherkaoui, Professor (404-894 -8336)[mohammed.cherkaoui@me.gatech.edu] Ph.D.**,** University of Metz, France**,** 1995. Micro and nanomechanics; multiscale transition methods; crystal plasticity; behavior of materials with high strength and ductility; phase transformation; and smart materials.

Sang Hyun Cho, Associate Professor (404-385-1301) [scho@gatech.edu]**;** Ph.D.**,** Texas A&M University**,** 1997. Radiotherapy physics; cancer imaging; nanotechnology.

Seung-Kyum Choi, Assistant Professor (912-966-6771) [seungkyum.choi@me.gatech.edu]**;** Ph.D., Wright State University, 2006. Probabilistic risk assessment; reliability-based design; multidisciplinary design optimization; and decision support method.

Chaitanya S. Deo, Assistant Professor (404-385-4928) [chaitanya.deo@nre.gatech.edu] Ph.D., University of Michigan, 2003. Structure property relationships in nuclear materials: theory and simulations across electronic; atomic, mesoscopic and continuum scales. Radiation effects in materials for nuclear energy including structural materials and nuclear fuels identifying atomic mechanisms in defect mobility and interaction in crystalline solids and modeling the collective evolution of defects

Anna Erickson, Assistant Professor (404-894-3731) [anna.erickson@nre.gatech.edu] Ph.D, Massachusetts Institute of Technology, 2011. Advanced reactor design; nuclear safety and safeguards; radiation detection systems.

Srinivas Garimella, Professor (404-894-7479) [srinivas.garimella@me.gatech.edu] Ph.D., The Ohio State University, 1990. Heat transfer; thermal-hydraulics; microchannel phase change.

S. Mostafa Ghiaasiaan, Professor (404-894-3246) [mghiaasiaan@gatech.edu] Ph.D.**,** University of California, Los Angeles**,** 1983. Heat transfer; two-phase flow; nuclear reactor engineering. Professional Engineer.

Nolan E. Hertel, Professor (404-894-3601) [nolan.hertel@nre.gatech.edu] Ph.D., University of Illinois at Urbana-Champaign, 1979. Radiation spectrometry; transport; dosimetry and shielding; radiation detector simulations and design; neutron measurements and applications; computational dosimetry; radiation protection. Professional Engineer.

Bojan Petrovic, Professor (404-894-8173) [bojan.petrovic@gatech.edu] Ph.D., The Pennsylvania State University, 1995. Reactor physics; transport theory; shielding; Monte Carlo methods; advanced reactor design; nuclear fuel cycle; numerical simulations of nuclear systems.

Glenn E. Sjoden, Professor (404-894-5733) [glenn.sjoden@nre.gatech.edu] Ph.D. The Pennsylvania State University, 1997; Particle transport and numerical methods; nuclear systems analysis: power generation; defense programs; NDT; detection; and medical application; convective heat transfer; computational fluids; and high performance computing applications. Professional Engineer.

Weston M. Stacey, Jr., Regents' and Callaway Professor (404-894-3714) [weston.stacey@nre.gatech.edu] Ph.D.**,** Massachusetts Institute of Technology 1966. Fusion plasma physics; reactor physics and conceptual design for fusion and fission reactors.

C-K Chris Wang, Professor (404-894-3727) [chris.wang@nre.gatech.edu] Ph.D., The Ohio State University**,** 1989. Radiation physics; detection; protection and dosimetry; micro- and nano-dosimetry; radiobiological modeling; radiation biology; and radiotherapy modalities using neutrons**.** Professional Engineer.

Lei Zhu, Assistant Professor (404-385-3882) [leizhu@gatech.edu] Ph.D., Stanford University**,** 2007. Medical imaging; radiation therapy.

Adjunct Faculty Affiliated with the Medical Physics Program

ZongJian (Z.J.) Cao, Professor of Radiology, Medical College of Georgia and Co-director of Medical Physics, MCG Health Inc., Adjunct Professor at Georgia Tech [zcao@mail.mcg.edu] Ph.D.**,** Indiana University**,** 1986. Certified by the American Board of Science in Nuclear Medicine 1995, Single photon emission computed tomography (SPECT); positron emission tomography (PET); PACS; internal dosimetry estimation.

Anees Dhabaan, Assistant Professor of Radiation Oncology and Director of Medical Physics Residency Program, Emory University School of Medicine; Adjunct Assistant Professor at Georgia Tech (404-778-3535) [anees.dhabaan@emory.edu]; Ph.D., University of Birmingham, England, United Kingdom, 1994; Diplomate, American Board of Radiology 2003; Head physicist for the stereotactic radiosurgery program at Emory University; neutron and photon transport and the use of Monte Carlo method in dense media; clinical services including implementing new technologies.

Eric S. Elder, Assistant Professor of Radiation Oncology and Director of Clinical Medical Physics, Emory University School of Medicine, Adjunct Assistant Professor at Georgia Tech (404-778-2304) [eric@radonc.emory.org]; Ph.D., Georgia Institute of Technology, 1997. Certified by the American Board of Radiology – Therapeutic Radiologic Physics 1997; image-guided radiation therapy (IGRT) methods; endovascular brachytherapy.

Tim Fox, Associate Professor of Radiation Oncology and Director of Medical Physics Division, Department of Radiation Oncology, Emory University School of Medicine, Adjunct Associate Professor at Georgia Tech (404-778-2304) [tim@radonc.emory.org]; Ph.D., Georgia Institute of Technology, 1994. Diplomate, American Board of Radiology 1997; Optimization algorithms; clinical decision making software; dose calculation and advanced treatment planning system; molecular imaging; adaptive radiation therapy.

Tom C.-C. Hu, Project Officer, The Biomedical Advanced Research and Development Authority (BARDA), within the Office of the Assistant Secretary for Preparedness and Response (ASPR) in the U.S. Department of Health and Human Services (HHS) [tom.hu@hhs.gov] Part-Time Assistant Professor of Radiology and Founding Director of Small Animal Imaging Program, Medical College of Georgia; [thu@mail.mcg.edu]; Adjunct Assistant Professor at Georgia Tech; Ph.D.**,** Carnegie Mellon University**,** 2001; MBA, Villanova University, 2005. Non-invasive magnetic resonance imaging (MRI) in small animals.

Nasser Maleki, Director of Medical Physics, Memorial Health University Medical Center, Adjunct Professor at Georgia Tech (912-350-8490) [malekna1@memorialhealth.com]; Ph.D., University of Nebraska, 1981. Diplomat, American Board of Radiology 1988; Stereotactic radiosurgery; internal organ motion during radiation treatment; quality management in radiation treatment; software development for standardization of medical physics practice.

Jonathon A. Nye, Assistant Professor of Radiology, Emory University School of Medicine (404-778-4227) [jnye@emory.edu] Ph.D., University of Wisconsin – Madison, 2005. Nuclear Medical Physics; Radioisotope production; Positron emission tomography; Kinetic Modeling.

Huichen Wang, Assistant Professor of Radiation Oncology, Emory University School of Medicine (404-778-1838) [hwang55@emory.edu] Ph. D., Academy of Medical Science, China, 1992. Mechanism of radiation induced DNA double strand break repair in the central nervous system; Role of DNA repair in carcinogenesis, neurodegeneration and viral infection; Molecular basis of radiation sensitivity of glioblastoma multiformes and radiation risk to normal neuronal cells; Efficacy of radiation therapy to tumors and protect the central nervous system from low and high LET radiation.

Other Faculty

William J. Wepfer, Eugene C. Gwaltney, Jr. Chair of the Woodruff School and Professor (404-894-3200) [bill.wepfer@me.gatech.edu] Ph.D., University of Wisconsin-Madison, 1979. Heat transfer; energy systems; and fuel cells.

Armin Ansari, Adjunct Associate Professor; Health Physicist, Radiation Studies Branch, Centers for Disease Control and Prevention (770-488-3654) [AAnsari@cdc.gov]; Ph.D., University of Kansas, 1989; radiation emergency preparedness and response; radiation biology; internal dosimetry.

Dwayne Blaylock, Manager NRE/MP laboratories and Research Engineer II (404-894-3606) [dwayne.blaylock@nre.gatech.edu] M.S. Nuclear Engineering**,** Georgia Institute of Technology**,** 1997**.** Radiation physics; computer modeling; reactor physics; modeling of activation and spallation products.

Justin Hastings, Assistant Professor (404-385-2829) [justin.hastings@inta.gatech.edu] Ph.D., University of California, Berkeley, 2008. Non-state nuclear proliferation; state weakness and proliferation; illicit trafficking; logistics and organizational structures of proliferation networks; application of conventional findings to nuclear issues.

Jarrod Hayes, Assistant Professor (404.894.0289) [jarrod.hayes@gatech.edu]; Ph.D., University of Southern California, 2009. Nuclear proliferation; nuclear strategy and arms control; South and East Asia; Europe.

Laurence J. Jacobs, Professor (404 -894-2344) [laurence.jacobs@coe.gatech.edu] Ph. D, Columbia University, 1987. Development of measurement techniques for the quantitative nondestructive evaluation of structural materials; nonlinear acoustics for damage characterization and life prediction of structural materials.

Sheldon M. Jeter, Associate Professor (404-894-3211) [sheldon.jeter@me.gatech.edu] Ph.D.**,** Georgia Institute of Technology**,** 1979. Heat transfer; thermal hydraulics. Professional Engineer.

Bernd Kahn, Professor Emeritus (404-407-6776) [bernd.kahn@me.gatech.edu] Ph.D.**,** Massachusetts Institute of Technology**,** 1960. Radiochemistry; radiochemical analysis; radiological monitoring.

Ratib Karam, Professor Emeritus (404-894-3620) [ratib.karam@nnrc.gatech.edu] Ph.D.**,** University of Florida**,** 1963. Reactor physics; transport theory.

Mohammad Khan, Assistant Professor (404-778-4126) [m.k.khan@emory.edu] Ph.D., University of Tennessee – Knoxville, 2002. Research interests include clinical outcome studies; physics translational research with emphasis on newer concepts and medical technologies; comparative effectiveness research; and development of phase I/II clinical trials.

Benjamin Klein, Associate Professor (912-966-7945) [bklein@gatech.edu] Ph.D.**,** University of Illinois at Urbana-Champaign, 2000. Reactor physics; transport theory; optical; optoelectronic; and electronic device simulation and design; wide-bandgap semiconductors; nanowire FETs and LEDs; scintillator characterization and design; photonic crystal devices

Margaret E. Kosal, Assistant Professor (404-894-9664) [margaret.kosal@inta.gatech.edu] Ph.D., University of Illinois at Urbana-Champaign, 2001. Nuclear, chemical, and biological nonproliferation; counterproliferation; counterterrorism; and consequence management; CBRN defensive countermeasures and policy; deterrence; emerging technologies (nanotechnology, including metamaterials; biotechnology, including synthetic genomics; neuro- and cognitive sciences) and international security.

William D. Kulp, Research Scientist II (404-385-3248) [wdkulp@mailaps.org] Ph.D.**,** Georgia Institute of Technology**,** 2001**.** Nuclear structure; gamma-ray spectroscopy; nuclear data evaluation; nuclear materials detection; replacement of radioactive sources; accelerator physics.

David L. McDowell, Carter N. Paden Jr. Distinguished Chair in Metals Processing and Regents' Professor (404-894-5128) [david.mcdowell@me.gatech.edu] Ph.D, University of Illinois at Urbana-Champaign**,** 1983. Effects of radiation on metals. multiscale modeling and materials design

Robert McGrath, Adjunct Professor, Vice President, Georgia Institute of Technology and Director, Georgia Tech Research (404-407-7400) [robert.mcgrath@gtri.gatech.edu] Ph.D., University of Michigan, 1980. Plasma materials interactions and high heat flux components for magnetic confinement fusion; plasma driven chemistries for microelectronics manufacturing; charged particle interactions with materials.

Lawrence P. Rubin, Assistant Professor (404-385-4081) (lawrence.rubin@inta.gatech.edu) Ph.D., University of California, Los Angeles, 2009. Nuclear nonproliferation; terrorism; energy security; and Middle East politics and security.

Dennis Sadowski, Research Engineer II (404-385-1868) [dennis.sadowski@me.gatech.edu]; M.S., University of Illinois at Chicago, 1986. Thermal sciences; and design and construction of experimental equipment.

Richard Sanchez, Adjunct Professor; Research Director, CEA Saclay, Professor at INSTN (+33 1 69085404, [richard.sanchez@cea.fr] Ph.D. University of Washington 1981, Ph.D. University of Orsay 1979; reactor physics; transport theory and numerical methods.

Adam N. Stulberg, Associate Professor and Co-Director of the Center for International Strategy, Technology, and Policy (404-385-0090) [adam.stulberg@inta.gatech.edu]; Ph.D., University of California, Los Angeles, 1996. Nuclear strategy; arms control; and nonproliferation; internationalization of the fuel cycle; illicit nuclear trafficking; nanotechnology and international security.

Christopher J. Summers, Professor (404-385-0697) [chris.summers@mse.gatech.edu] Ph.D., Physics, University of Reading, England, 1966. Phosphors and luminescent materials for displays; solid-state lighting and scintillators; synthesis of nanophosphors and quantum dots; photonic crystals; optical and electrical properties of semiconductors; semiconductor growth; particularly the development of new atomic layer deposition techniques and processes for optimizing photonic crystals and metamaterials.

Tristan Utschig, Assistant Director for the Scholarship and Assessment of Teaching and Learning, Center for the Enhancement of Teaching and Learning (404-385-2949) [tris.utschig@cetl.gatech.edu] Ph.D., University of Wisconsin-Madison, 2000. Faculty development; assessment; scholarship of teaching and learning; thermochemical nuclear safety analysis; hydrodynamics modeling.

James Wall, Project Manager, Nuclear Nondestructive Evaluation, Electric Power Research Institute, Adjunct Assistant Professor at Georgia Tech (704-595-2659) [jwall@epri.com] Ph.D., University of Tennessee – Knoxville, 2007. Radiation damage; aging related degradation of metals and composite materials; physical metallurgy; thermodynamics.

Ce Yi, Research Engineer I (404-894-3718) [ce.yi@nre.gatech.edu]; Ph.D., University of Florida, 2007; Radiation transport simulation using deterministic and Monte Carlo methods; deterministic transport algorithms and code development; nuclear multi-group cross section generation; medical imaging simulation; numerical methods and parallel computing.

Nazia Zakir, Radiation Safety Officer**,** (404-894-3621) [nazia.zakir@ehs.gatech.edu]
M.S. Radiological Physics, Rutgers University, 1999. Operational health physics; radiological safety; radiological monitoring.

Dingkang Zhang, Research Engineer II**,** (404-894-2087) [dingkang.zhang@gatech.edu] Ph.D., Georgia Institute of Technology, 2005. Computational reactor and medical physics; radiation transport theory; hybrid transport methods.

Ting Zhu, Associate Professor (404-894-6597) [ting.zhu@me.gatech.edu] Ph.D., Massachusetts Institute of Technology**,** 2004. Mechanical behavior of solids and thin films; nanomechanics of defect in crystals; coupled mechano-chemical phenomena; multiscale and nuclear energy related materials modeling.

Nuclear Science and Engineering Research Centers

Fusion Research Center: [www.frc.gatech.edu], Director, Weston Stacey (NRE), [weston.stacey@nre.gatech.edu] (404-894-3714). Plasma edge physics, plasma and neutral particle transport, fusion neutron source applications, next-step tokamak design analysis, transmutation of spent nuclear fuel.

Pioneer Research in Nuclear Detection: [www.prind.gatech.edu], Director, Nolan E. Hertel (NRE),[nolan.hertel@nre.gatech.edu] (404-894-3601). Neutron detection and spectroscopy, radiation dosimetry, transport and detector simulations, multi-scale materials modeling, semi-conductor and phosphor/scintillator materials, large scale optimization

Radiological Science and Engineering Laboratory: [www.rsel.gatech.edu], Director, Glenn E. Sjoden (NRE), [glenn.sjoden@nre.gatech.edu] (404-894-5733): The RSEL provide a wide variety of nuclear and accelerator-driven research and irradiation services to the needs of faculty, staff and external customers. Facilities in the RSEL include: the Varian Clinical Linear Accelerator (VCLA) laboratory, A Neutron Reference Field Laboratory, A Neutron Generator Irradiation Facility, A Gamma Calibration Laboratory, and Sub-critical Graphite and Natural Uranium Pile, as well as various radiological support instruments.

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
Masters	4	5	6	13	14
PhD	0	1	1	1	1

Graduate Student Enrollment: 50 Masters/29 Ph.D.

Nuclear Science and Engineering Faculty

Fatih Aydogan, Assistant Professor (208-533-8107) [fatih@uidaho.edu] Ph.D., Hacettepe University. Computational thermal hydraulics; two-phase flow; nuclear safety; nuclear system design and analysis; uncertainty and best-estimate methodologies; sub-channel analysis; small modular reactors.

Indrajit Charit, Assistant Professor **(**208-885-5964) [icharit@uidaho.edu] Ph.D. Microstructure-Property Correlations, Nuclear Materials, High Temperature Mechanical Behavior of Materials (Creep, Superplasticity, Creep-Fatigue), Nanocrystalline Materials, Advanced Processing Techniques (Mechanical Alloying, Friction Stir Processing), Light Metals, Multi-functional Materials.

John Crepeau, Professor **(**208-885-5228) [crepeau@uidaho.edu] Ph.D. Transition to turbulence in fluid flow and fluid stability; flow visualization; experimental and theoretical studies of drying and drying processes. Solidification of materials with internal heat generation.

Supathorn Phongikaroon, Assistant Professor (208-533-8123) [supathor@uidaho.edu] Ph.D. Pyroprocessing technology--theoretical and experimental studies in electrorefinery, oxide reduction and chemistry, and ion exchange. Interfacial phenomena and multiphase flow systems involving in nuclear and chemical engineering applications.

Akira Tokuhiro, Professor **(**208-533-8102) [tokuhiro@uidaho.edu] Ph.D., Thermo-fluid sciences, experiments, nuclear reactor engineering, design and safety, thermohydraulics, convective heat transfer, applied biometrics, energy processes modeling, CFD, applications of silica and polymer gels.

Vivek Utgikar, Associate Professor **(**208-533-8117) [vutgikar@uidaho.edu] Ph.D., Development of energy utilization systems - nuclear hydrogen production, utilization and safety; reactor-hydrogen production interface; energy analysis; electrochemical engineering and fuel cells.

Other Faculty

Fred Gunnerson, Emeritus Faculty (208-282-7900) Ph.D. Thermo-fluids, high temperature heat transfer, nuclear science.

Steven Howe, Director (208-526-6103) [steven.howe@inl.gov] Ph.D.**,** Kansas State University**,** 1980**.** Nuclear Space, Space nuclear power, and Propulsion. Website: http://www.csnr.usra.edu/

Jesse McBurney-Rebol, Instructor **(**208-533-5769) [jrebol@if.uidaho.edu] MS. Nuclear criticality safety, human factors engineering, spent fuel handling system design, and nuclear engineering management.

Donald McEligot, Distinguished Affiliate Faculty **(**208-533-8120) [donaldm@uidaho.edu] Ph.D. Thermal science: convective heat transfer, fluid mechanics, turbulent, laminar and transitional shear flow: experimental, analytical and computational.

Nuclear Science and Engineering Research Centers

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.*	3	8	4		
Masters*	5	2	8		
PhD*	3	2	1		

**Numbers indicate only Nuclear Engineering Degrees*

Graduate Student Enrollment: 25 Masters/5 Ph.D.
ABET Accreditation: B.S. in NE

Nuclear Science and Engineering Faculty

Michael J. Lineberry, Research Professor and Director of Institute of Nuclear Science and Engineering **(**208-533-8114) [mjl@isu.edu]; Ph.D., California Institute of Technology**,** 1972. Fast reactor fuel cycle, safeguards, and reactor physics.

Richard Brey, Assistant Chair and Professor, Radiation Safety Officer. (208-282-2667) [breyrich@isu.edu] PhD, Purdue University. 1994. Health physics, internal dosimetry, radiation instrumentation, environmental radioactivity.

Eric A. Burgett, Assistant Professor (208-282-2220) **[**burgeric@isu.edu] Ph.D.**,** Georgia Institute of Technology**,** 2010. Radiation detector development; scintillator detectors; semiconductor detectors; novel detector materials; nanophotonics; homeland security; nuclear nonproliferation; nuclear fuels; nuclear materials; detector calibrations; neutron spectroscopy; health physics.

Mary Lou Dunzik-Gougar, Assistant Professor (208-282-7809) **[**mldg@isu.edu]**;** PhD, Pennsylvania State University**,** 2003. Nuclear fuel cycle; radioactive waste management; waste form development; irradiated nuclear graphite.

Jason T. Harris, Assistant Professor (208-282-3364) **[**harrjaso@isu.edu]**;** Ph.D., Purdue University**,** 2007. Health physics (reactor and environmental); radiation detection and measurement; instrumentation; accelerator applications. Website: http://www.physics.isu.edu/staff/Jason_H.html

George R. Imel, Professor and Dean of College of Science and Engineering (208-705-2344); **[**gimel@isu.edu**];** Ph. D.**,** Pennsylvania State University**,** 1971. Experimental reactor physics, fast reactor physics.

Richard T. Jacobsen, Professor (208-282-4191); **[**jacorich@isu.edu]; Ph.D. (Engineering Science), Washington State University, 1972. Thermophysical properties of fluids and fluid mixtures; thermophysical properties of hydrogen; thermophysical properties of natural gas mixtures; energy system design and analysis; methods of developing thermophysical property formulations and equations of state for engineering system design and analysis. Professional Engineer.

Brian G. Williams, Associate Professor, Mechanical Engineering (208-282-4129)**; [**willbria@isu.edu]**;** Ph.D., Mechanical Engineering**,** Utah State University**,** 1997. Thermodynamics, heat transfer, fluid flow; thermal-fluid experimentation; applications to energy systems. Professional Engineer.

Other Faculty

Steve Aumeier, Adjunct Faculty **(**208-522-7479**);** Ph.D.

Bob Boston, Advanced Test Reactor Team Leader **(**208-533-4250) **[**bostonrd@id.doe.gov]**;** MS

Kermit Bunde, Criticality Safety SME **(**208-526-5188) **[**bundaka@id.doe.gov] MS

Todd C Gansauge, Instructor **(**208-282-2968) **[**ganstodd@isu.edu]**;** Masters of Science Mechanical Engineering**,** University of Utah**,** 1990. Reactor physics; radiation detection. Professional Engineer.

J. Stephen Herring, Adjunct Faculty **(**208-526-9497) Ph.D.

Jay F. Kunze, Emeritus **(**208-282-4147) [kunzejay@isu.edu] Ph.D.**,** Carnegie-Mellon**,** 1959. Reactor engineering, reactor physics, health physics, medical physics. Professional Engineer.

Harold Larson, Adjunct Faculty **(**208-523-0694) Ph.D. Reactor Kinetics

D. Scott Lucas, Adjunct Faculty **(**208-526-2366) Ph.D.

Adam Mallicoat, Reactor Supervisor **(**913-638-6800) **[**malladam@isu.edu]**;** BS in Mechanical Engineering**,** Kansas State University**,** 2008**.** MCNP Simulations.

Kathryn A. McCarthy, Adjunct Faculty (208-526-9392) Ph.D.

Abderrafi M Ougouag, Adjunct Professor (208-526-7659) **[**Abderrafi.Ougouag@inl.gov] Ph.D., University of Illinois, Urbana**,** 1984. Computational methods development in reactor physics; theoretical and applied neutron physics; high temperature gas-cooled reactor physics.

Richard Schultz, Adjunct Faculty (208-526-9548) PhD.

Nuclear Science and Engineering Research Centers

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Idaho Accelerator Center: Director, Doug Wells, Ph.D. (208-282-5875); Radiation effects, NDT/NDE elemental analysis, imaging, nuclear medicine (such as BNCT), health physics, instrument testing and calibration. FY2005 Research Expenditures: ~$8 million.

Environmental Assessment and Monitoring Laboratory: Director, Richard Brey, Ph.D. (208-282-2667). Low level radiation monitoring, instrument calibration, trace element analysis. High range dosimetry support for the Idaho Accelerator Center. Annual Research Expenditures: $500,000.

Environmental Monitoring Laboratory: Director: Tom Gesell, Ph.D. (208-282-3669). Low level radiation monitoring, radioanalytical analysis, instrument calibration, trace element analysis. Research Expenditures: $300,000.

Skyline Laboratory: Director, Brian Williams, Ph.D. Vertical and horizontal thermal hydraulic test loops, laser isotope enrichment laboratory. Research expenditures ~$400,000.

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B.S.	31	19	12	25	47
Masters	12	3	8	19	12
PhD	6	4	10	6	7

Graduate Student Enrollment: 20 Masters/43 Ph.D
ABET Accreditation: B.S. (N.E.)

Distance Education Program
Offers Nuclear Engineering Courses Online

Nuclear Science and Engineering Faculty

James F. Stubbins, Willett Professor and Department Head (217-333-6474) [jstubbin@illinois.edu] Ph.D., University of Cincinnati**,** 1975. Development, analysis and application of materials, primarily for energy-related applications; nuclear systems design and analysis; nuclear materials; irradiation damage and effects, mechanical properties; high temperature corrosion; electron microscopy. Professional Engineer. Website: http://materials.ne.uiuc.edu

Roy A. Axford, Professor (217-333-4399) [r-axford@illinois.edu - prefers phone or regular mail] Sc.D., Massachusetts Institute of Technology, 1958. Reactor physics, safety, and risk assessment; radiation hydrodynamics; heat transfer; optimal reactor control; synthesis and nuclear fuel management; hydrodynamic stability; lie groups and systems of nonlinear differential equations; plasma physics; group invariant difference schemes.
Website: http://npre.illinois.edu

Brent J. Heuser, Professor (217-333-9610) [bheuser@illinois.edu] Ph.D.**,** The University of Michigan**,** 1990. Application of scattering techniques to materials science; hydrogen in metals; nuclear materials, fuel and cladding. Website: http://positron.ne.uiuc.edu

Tomasz Kozlowski, Assistant Professor (217-333-4096) [txk@illinois.edu] Ph.D., Purdue University, 2005. BWR stability; numerical analysis; deterministic reactor safety methods; multi-scale multi-physics coupling methods; reactor physics and reactor thermal-hydraulics.
Website: http://arts.npre.illinois.edu/

Ling-Jian Meng, Associate Professor (217-333-7710) [ljmeng@illinois.edu] Ph.D., University of Southampton-UK**,** 2001. High resolution X and gamma ray detectors for radiological imaging applications; ultra-high resolution SPECT system for small animal brain studies; multi-modality imaging systems; nuclear imaging system. Website: http://radimg.ne.uiuc.edu

Zahra Mohaghegh, Assistant Professor (271-300-5076) [zahra13@illinois.edu] Ph.D., University of Maryland, College Park, 2007. Safety Culture; Human Reliability; Organizational Influences on Technical System Risk; Socio-Technical Risk Analysis; Treatment of Dependent and Common Cause Failures; Probabilistic Physics of Failure; Component and System Reliability; Risk-Informed Decision Making and Regulation; Probabilistic Risk Assessment and Management.
Website: http://www.npre.illinois.edu

Magdi Ragheb, Associate Professor (217-333-6569) [mragheb@illinois.edu] Ph.D., University of Wisconsin, 1978. Computational methods; radiation protection and shielding; probabilistic risk assessment; applied artificial intelligence; supercomputing.

David N. Ruzic, Bliss Professor (217-333-0332) [druzic@illinois.edu] Ph.D., Princeton University**,** 1984. Experimental fusion research; modeling of edge plasma; atomic properties of potential first-wall materials; plasma-material interaction; plasma processing of semiconductors; extreme ultraviolet (EUV) sources for lithography; physical and chemical vapor deposition.
Website: http://cpmi.ne.uiuc.edu

Clifford E. Singer, Professor (217-333-1814) [csinger@illinois.edu] Ph.D., University of California, Berkeley, 1971. Advanced spacecraft propulsion systems, spent nuclear fuel management, nuclear proliferation, energy systems analysis, and energy econometrics. Website: http://npre.illinois.edu

Clair Sullivan, Assistant Professor (217- 300-0197) [cjsulli@illinois.edu] Ph.D., University of Michigan, 2002. Radiation detection; instrumentation; radiation dosimetry and shielding; measurements and localization of algorithms for detector devices. Website: http://npre.illinois.edu

Rizwan Uddin, Professor (217-244-4944) [rizwan@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign**,** 1987. Advanced computational methods; theoretical and CFD; radiation transport and reactor physics; reactor engineering; multiphase flow; reliability and risk analysis; virtual reactor.
Website: http://verl.npre.illinois.edu/

Zhang, Yang Assistant Professor (217-300-0452) [zhyang@illinois.edu] Ph.D., Massachusetts Institute of Technology, 2010. Disordered materials such as liquids and glasses, cement and asphalt, and innumerable bio and soft materials; materials under extreme environments; neutron and X-ray scattering; modeling and simulation. Website: http://zhang.npre.illinois.edu

Other Faculty

Michael Aref, Adjunct Assistant Professor (217-333-2295) [maref@illinois.edu] Ph.D. and M.D., University of Illinois at Urbana-Champaign and College of Medicine, 2006. Quantitative biomedical imaging; spectroscopic detection; functional imaging; improved diagnostic tumor physiology parameter estimation.

Thomas J. Dolan, Adjunct Professor (217-333-2295) [dolantj@illinois.edu] Ph.D.**,** University of Illinois at Urbana-Champaign**,** 1970. Plasma confinement methods and fusion reactor designs; low energy nuclear reactions.
Website: https://wiki.engr.illinois.edu/display/npre421/Professor+Dolan+Homepage

Masab H. Garada, Adjunct Assistant Professor (217-333-2295) [masab.garada@provena.org] Ph.D.**,** University of Illinois at Urbana-Champaign**,** 2006. Intensity modulated radiation therapy (IMRT); image guided radiation therapy (IGRT); three-dimensional conformal radiation therapy; linac radiosurgery and stereotactic; low dose-rate brachytherapy: prostate seed implants, medium dose-rate brachytherapy; cervical cesium implants, high dose-rate brachytherapy; iridium lung implants, tumor and normal tissue response and radiobiological models.

Daniel F. Hang, Emeritus Professor (217-333-3348) [d-hang@illinois.edu] M.S., University of Illinois at Urbana-Champaign, 1949. Fuel cycle and economics. Professional Engineer.
Website: http://npre.illinois.edu

Barclay Jones, Emeritus Professor (217-333-3535) [bgjones@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 1966. Thermal hydraulics/reactor safety; multiphase flow; boiling heat transfer; turbulence measurement and modeling; flow-induced vibrations and hydroacoustics; human-machine interfaces for reactor control and simulation; food irradiation safety.

Brian E. Jurczyk, Adjunct Research Assistant Professor (217-333-2295) [bjurczyk@starfireindustries.com] Ph.D., University of Illinois at Urbana-Champaign, 2003. Advanced plasma debris mitigation; advanced tin and lithium fuels research; optics contamination; erosion and lifetime research; self-healing optics research; halide etching and condensable material removal; fast ion suppression with light gas mixtures. Website: http://www.starfireindustries.com

Charles P. Marsh, Adjunct Professor (217-333-2295) [Charles.P.Marsh@usace.army.mil] Ph.D., University of Illinois at Urbana-Champaign, 1989. Ferroelectric crystal degradation and effects on electron emission; bulk metallic glass formation; synthesis and modeling of CNT based structural materials; quantum dot based self-sensing materials; corrosive degration, assessment and mitigation; conventional and enhanced pumped thermal flow using Microencapsulated Phase Change Materials (MPCM) and nanofluids.

George H. Miley, Emeritus Professor (217-333-3772) [ghmiley@illinois.edu] Ph.D., The University of Michigan, 1959. Fusion systems; plasma engineering; reactor kinetics; high voltage technology; nuclear

pumped lasers; direct energy conversion; hydrogen energy production; low-energy nuclear reactions in solids. Professional Engineer. Website: http://lenr.ne.uiuc.edu/

David W. Miller, Adjunct Assistant Professor (217-333-1098) [dwmiller2@aep.com] Ph.D., Purdue University, 1976. Occupational dose reduction at nuclear power plants; colloidal source term removal and mitigation studies in primary coolant at light water reactors; tritium recapture modeling at pressurized water reactors; UNSCEAR US effluent databases and analysis; radiological work management research at nuclear power plants; medical shielding validation studies; ACCESS relational database development for dose trend analysis.

Richard F. Nelson, Adjunct Professor (217-351-0846) [rfnelson@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 1984. Radiological physicist; Radiation oncology-external beam and internal sources; diagnostic radiology; consultant physicist.

Martin J. Neumann, Adjunct Assistant Professor (217-840-5490) **[**martin@mjneumann.com] Ph.D., University of Illinois at Urbana-Champaign**,** 2007. EUVL related technologies; semiconductor fabrication and processing and plasma-material interactions related to fusion applications.

William R. Roy, Adjunct Professor (217-333-1197) [wroy@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign**,** 1985. Geochemistry and soil/environmental chemistry; equilibrium distribution and thermodynamics of chemical constituents at solid-liquid interfaces; solid-phase equilibria of natural and anthropogenic materials in aqueous; solution; environmental impacts of coal utilization; chemical fate and transport of contaminants in soil and groundwater; carbon sequestration; radioactive waste management.

Robert A. Stubbers, Adjunct Research Assistant Professor (217-333-2295) [rstubbers@starfireindustries.com] Ph.D., University of Illinois at Urbana-Champaign, 1994. Plasma innovations for aerospace; defense, industrial, instrumentation, medical; semiconductor applications. Website: http://www.starfireindustries.com

Nuclear Science and Engineering Research Centers

The **Center for Plasma Material Interactions (CPMI),** http://cpmi.illinois.edu,
objective is to study plasma material interactions relevant to fusion, semiconductors, and plasma manufacturing through a combination of computational and experimental means. Projects are supported by both government and commercial partners to further the application and knowledge of plasma physics.

The **North American Technical Center (NATC) for the Information System on Occupational Exposure (ISOE)** is located at the Department of Nuclear, Plasma, and Radiological Engineering. NATC is one of four technical centers for the Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency and International Atomic Energy Agency (IAEA) global occupational dose reduction information exchange engineering database. NATC manages the Canadian, Mexican, and US nuclear power plants data analysis. Website at isoe-network.net

KANSAS STATE UNIVERSITY

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	0	0	0	0	0
Masters	1	3	7	1	2
PhD	0	1	1	0	3

Graduate Student Enrollment: 3 Masters/9 Ph.D.
ABET Accreditation: ME

Distance Education Program
Offers Nuclear Engineering Courses Online
www.mne.ksu.edu/big12ne
http://www.dce.k-state.edu/engineering/minors/nuclear/

Nuclear Science and Engineering Faculty

John K. Shultis, Professor and Nuclear Program Director (785-532-5626) [jks@ksu.edu]; Ph.D., University of Michigan, 1969. Radiation transport and shielding; Monte Carlo techniques; radiation detector design; simulations and modeling. Website: www.mne.ksu.edu/~jks

William L. Dunn, Associate Professor (785-532-5628); [dunn@mne.ksu.edu]; Ph.D., North Carolina State University, 1974. Radiation measurement and applications; explosives detection; nondestructive evaluation; quantitative analysis; radiation shielding and dosimetry; Monte Carlo methods and applications; fusion-fission energy systems. Website: www.mne.ksu.edu/people/faculty/dunn

Douglas S McGregor, Professor (785-532-4093) [mcgregor@ksu.edu]; Ph.D., University of Michigan, 1993. Development of room temperature gamma ray spectrometers; semiconductor radiation detectors; solid-state neutron detectors; miniaturized neutron detectors; scintillator crystal growth; compound semiconductor crystal growth; radiation detector arrays.
Website: http://www.mne.ksu.edu/people/faculty/mcgregor

Nuclear Science and Engineering Research Centers

SMART Lab: design, fabrication and testing of novel radiation detectors. TRIGA MArk II Reactor Facility: 1.25 MS steady power and pulsing capability.

UNIVERSITY OF MARYLAND

Materials Science and Engineering
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College Park, MD 20742
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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
Masters	0	3	4	2	3
PhD	0	0	0	0	0

Graduate Student Enrollment: 1 Masters/8 Ph.D.
ABET Accreditation: Materials Science and Engineering

Distance Education Program
Offers Nuclear Engineering Courses and Degree Online
http://www.oaee.umd.edu/

Nuclear Science and Engineering Faculty

Mohamad Al-Sheikhly, Professor (301 -405-5214) [mohamad@umd.edu] Ph.D., University of Newcastle Upon Tyne, England, 1981. Polymers, radiation engineering, electronic packaging materials, environmental effects.

Mohammad Modarres, Professor (301-405-5226) [modarres@umd.edu] Ph.D., Massachusetts Institute of Technology, 1979. Probabilistic risk assessment, Probabilistic modeling of failure mechanisms, Reliability analysis of complex engineering systems, nuclear safety analysis.

Ali Mosleh, Professor (301-405-5215) [mosleh@umd.edu] Ph.D., University of California at Los Angeles, 1981. Risk and safety assessment, reliability analysis, and decision analysis.

Gary Pertmer, Associate Dean, A. James Clark School of Engineering & Associate Professor (301-405-3936) [pertmer@umd.edu] Ph.D., University of Missouri-Columbia, 1978. Reliability engineering, nuclear power systems design and analysis.

Nuclear Science and Engineering Research Centers **University of Maryland Radiation Facilities**: Laboratory for Radiation and Polymer Science; High-Energy Linear Accelerator (LINAC);The Biophysical and Polymer Radiation Laboratory

MASSACHUSSETTS INSTITUTE OF TECHNOLOGY

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	14	15	10	13	18
Masters	22	24	23	18	25
PhD	11	15	15	15	14

Graduate Student Enrollment: 66 Masters/55 Ph.D.
ABET Accreditation: SB

Nuclear Science and Engineering Faculty

Richard K. Lester, Japan Steel Industry Professor and Head of the Department of Nuclear Science and Engineering and director of Industrial Performance Center (617-253-7704) [rklester@mit.edu] Ph.D., Massachusetts Institute of Technology, 1979. The organization and management of systems of innovation; and the public and private management of energy technologies.
Website: http://web.mit.edu/nse/lester/index.html

Ronald G. Ballinger, Professor of Nuclear Science and Engineering and Materials Science and Engineering (617-253-5118) [hvymet@mit.edu] Sc.D., Massachusetts Institute of Technology, 1982. Corrosion and fatigue. Fuel behavior modeling, environmental effects on materials performance.
Website: http://web.mit.edu/nse/people/faculty/ballinger.html

Emilio Baglietto, Assistant Professor (617-253-4231) [emiliob@mit.edu] Ph.D., Tokyo Institute of Technology, 2004. Turbulence modeling; Unsteady flow phenomena; multiphase flow and boiling; virtual reactor modeling. Website: http://web.mit.edu/nse/people/faculty/baglietto.html

Jacopo Buongiorno, Associate Professor of Nuclear Science and Engineering and Mechanical Engineering (617-253-7316) [jacopo@mit.edu] Ph.D., Massachusetts Institute of Technology, 2000. Multi-phase flow and heat transfer; advanced reactor design; reactor thermal-hydraulic; nanofluid technology. Website: http://web.mit.edu/nse/people/faculty/buongiorno.html

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Ian H. Hutchinson, Professor and Co-Principal of the Alcator-C Mod Program **(**617-253-8670) [ihutch@mit.edu] Ph.D.**,** Australian National University**,** 1976. Plasma physics and controlled fusion. Website: http://web.mit.edu/nse/people/faculty/hutchinson.html

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Mujid S. Kazimi, TEPCO Professor of Nuclear Engineering and Mechanical Engineering; Director of Center for Advanced Nuclear Engineering Systems – CANES (617-253-4206)[kazimi@mit.edu] Ph.D., Massachusetts Institute of Technology, 1973. Nuclear reactor thermal and safety performance; Nuclear fuel design and analysis; nuclear fuel cycle optimization. Website: http://web.mit.edu/canes/

Ju Li, Battelle Energy Alliance Professor of Nuclear Science and Engineering and Professor of Materials Science (617-253-0166) [liju@mit.edu] Ph.D., Massachusetts Institute of Technology, 2000. Overcoming timescale challenges in atomistic simulations; energy storage and conversion; materials in extreme environments and far from equilibrium.
Website: http://web.mit.edu/nse/people/faculty/li.html

Felix Parra, Assistant Professor (617-253-9741) [fparra@mit.edu] Ph.D., Massachusetts Institute of Technology, 2009. Turbulence in magnetized plasmas; momentum in magnetic fusion devices.
Website: http://web.mit.edu/nse/people/faculty/parradiaz.html

Anne E. White, Assistant Professor (617-253-8667) [whitea@psfc.mit.edu} Ph.D., University of California, Los Angeles, 2008. Plasma physics, turbulence and turbulence-driven transport, fluctuation diagnostics for magnetic confinement fusion experiments.
Website: http://web.mit.edu/nse/people/faculty/white.html

Dennis G. Whyte, Professor; Director, Plasma Surface Interactions Science Center (617-252-1748) [whyte@psfc.mit.edu] Ph.D., Université du Quebec, 1992. Plasma-surface interactions physics and diagnostics for magnetic fusion energy; accelerator-based simulation of plasma-surface interaction in fusion reactors. Website: http://web.mit.edu/nse/people/faculty/whyte.html

Bilge Yildiz, Norman K. Rasmussen Assistant Professor of Nuclear Science and Engineering **(**617-324-4009) **[**byildiz@mit.edu] Ph.D.**,** Massachusetts Institute of Technology**,** 2002. Conducting oxide surfaces for enhanced activity and durability in high temperature electrocatalytic devices for hydrogen, synthetic gas (H2+CO), and electricity production; engineered micro- and nano-structures in alloys for improved resistance against corrosion and stress corrosion cracking in nuclear and other energy systems subject to harsh environments. Website: http://web.mit.edu/nse/people/faculty/yildiz.html

Other Faculty

George Apostolakis, Professor of Nuclear Science and Engineering and Engineering Systems (currently Commissioner of the Nuclear Regulatory Commission) (617-252-1570) [apostola@mit.edu] Ph.D., California Institute of Technology, 1973. Methods for probabilistic risk assessment of complex technological systems; risk management involving several stakeholder groups; decision analysis, human reliability models; organizational factors and safety culture; software dependability; risk-informed, performance-based regulation; risk assessment and management of terrorist threats
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John A. Bernard, Jr., Principal Research Engineer (617-253-4202) [bernardj@mit.edu] Ph.D., Massachusetts Institute of Technology. Closed-Loop Digital Control of Nuclear Reactors; Use of Nuclear Energy for the Exploration of Space; Artificial Intelligence Applications to Nuclear Reactors; Nuclear Medicine, particularly Neutron Capture Therapy; Health Physics; Radiation Biology; Operator Training; Reactor Operations; Energy Planning; and the Interaction of Technology and Law.
Website: http://web.mit.edu/nse/people/researchstaff/bernard.html

Peter Catto, Senior Research Scientist (617-253-5825)[catto@psfc.mit.edu] Ph.D.
Plasma and neutral flows; electric fields, and edge physics issues in diverted tokamak plasmas, and dipole stability. Website: http://www.psfc.mit.edu/people_new/faculty/catto.html

Sow-Hsin Chen, Professor of Nuclear Science and Engineering Emeritus (617-253-3810) **[**sowhsin@mit.edu] Ph.D.**,** McMaster University**,** 1964. Thermal Neutron Spectroscopy of Soft Condensed Matter. Website: http://web.mit.edu/nse/people/faculty/chen.html

Daniel R. Cohn, Senior Research Scientist; Head, Plasma Technology and Systems (617-715-5292) [cohn@psfc.mit.edu] Ph.D. Plasma enhanced reformation of hydrocarbon fuels into hydrogen, compact plasmatron fuel reformers, applications of on board generation of hydrogen for diesel engine emissions reduction and clean, high efficiency gasoline engine operation, plasma enhanced reforming of biofuels, plasma technology for high sensitivity detection of explosives and other homeland security/defense applications.

Michael J. Driscoll, Professor of Nuclear Science and Engineering Emeritus **(**617-253-4219) **[**mickeyd@mit.edu] Ph.D. Deep borehole waste disposal; Fast reactor physics and engineering.

Charles W. Forsberg, Research Scientist; Executive Director, MIT Nuclear Fuel Cycle Project **(**617-324-4010) [cforsber@mit.edu] Sc.D.**,** Massachusetts Institute of Technology**,** 1974**.** Development of integrated nuclear fuel cycles, advanced high-temperature nuclear reactors using liquid-salt coolants, and development of global nuclear-renewables energy systems. Professional Engineer.
Website: http://web.mit.edu/nse/people/faculty/forsberg.html

Aydin Karahan, Research Scientist **(**617-258-0752) [karahan@mit.edu] Ph.D.**,** Massachusetts Institute of Technology**,** 2009**.** Fuel Performance Modeling, Thermal-hydraulics, Neutronics; Modeling and Simulation of Multi-physics Multi-scale Systems; System Optimization.
Website: http://web.mit.edu/nse/people/researchstaff/karahan.html

Richard C. Lanza, Senior Research Scientist (617-253-2399) Ph.D. Radiation imaging; radiation detectors; nondestructive testing; radiological and industrial applications of radiation; development of new radiation sources.

Joseph V. Minervini, Senior Research Scientist (617-253-5503) [minervini@psfc.mit.edu] Ph.D., Massachusetts Institute of Technology. Applied superconductivity, superconductor stability and AC losses, cryogenic heat transfer, helium fluid dynamics, electromagnetics, low temperature measurements, superconducting magnet design and development for fusion technology and other large scale and power applications.

Ronald R. Parker, Professor Emeritus of Nuclear Science and Engineering and Electrical Engineering and Computer Science (617-258-6662) [parker@mit.edu] Sc.D., Massachusetts Institute of Technology, 1967. Plasma physics and controlled thermonuclear fusion.

Kord Smith, Korea Electric Power Company (KEPCO) Professor of the Practice (617-252-1570) [kord@mit.edu] Ph.D., Massachusetts Institute of Technology, 1980. Reactor analysis methods; computational methods; high performance computing (HPC)s.
Website: http://web.mit.edu/nse/people/faculty/smith.html

Neil E. Todreas, Professor of Nuclear Science and Engineering and Professor of Mechanical Engineering Emeritus (617-253-5296) [todreas@mit.edu] Ph.D. Reactor engineering; reactor thermal analysis; heat transfer and fluid flow.

Sidney Yip, Professor Emeritus of Nuclear Science and Engineering, and Materials Science and Engineering (617-253-3809) [syip@mit.edu] Ph.D., University of Michigan 1962. Statistical physics and condensed matter of sciences, atomistic simulations.
Website: http://web.mit.edu/nse/people/faculty/yip.html

Nuclear Engineering Research Centers

Plasma Science and Fusion Center [http://web.psfc.mit.edu/], Director, Professor Miklos Porkolab (Physics) [porkolab@psfc.mit.edu]. The Plasma Science and Fusion Center carries out a broad range of research in the science of plasmas, plasma based technologies, and fusion science and technology. With a budget of $32.8-million in FY06, the Center conducts experimental and theoretical research in understanding the physics of plasmas and its applications to magnetic and inertial confinement fusion, the physics of waves and beams, development of state-of-the-art superconducting magnet systems, and development of plasma technologies for environmental monitoring and pollution control and remediation. Foremost among these research activities is the Alcator Project, an experimental tokamak device for magnetic confinement fusion research and a National Facility, which accounts for more than half of the Center's FY06 research budget at $19.8-million.

Center for Advanced Nuclear Energy Systems [http://web.mit.edu/canes/], Director, Professor MujidKazimi (NSE). CANES has four research program areas: Advanced Reactor Systems, Nuclear Fuel Cycles, Enhanced Performance of Nuclear Power Plants, and Nuclear Energy and Sustainability. The Center offers three short summer professional courses: Nuclear Systems Safety, Reactor Technology for Power Plant Executives, and Probabilistic Methods for Nuclear Plant Management. Annual Research Expenditure: $5,000,000.

Industrial Performance Center (IPC) [http://web.mit.edu/ipc], Director, Richard K. Lester (Japan Steel Industry Professor of Nuclear Science and Engineering and Head, Department of Nuclear Science and Engineering). The Industrial Performance Center (IPC) is an MIT-wide research unit, based in the School of Engineering. The Center serves as a focus at MIT for interdisciplinary research on the rapidly changing global economy. Our interdisciplinary teams observe, analyze and report on strategic, technological, and organizational developments in a broad range of industries and examine the implications for society and the global economy. The IPC currently has four main research areas: local innovation systems; globalization and global value chains; energy innovation systems; and energy and industrial development in China.

MIT Research Reactor Director Prof. David E. Moncton [dem@mit.edu] Two medical irradiation facilities for NCT research and clinical trials, the fission converter based epithermal neutron beam has the highest intensity in the world. There are 11 beam port, 4 pneumatic tubes, 4 vertical thimbles in the graphite reflector, a prompt gamma neutron activation analysis facility, a neutron activation analysis lab, a gamma irradiation facility, and unique in-core irradiation loops for water chemistry, materials, and advanced nuclear fuel research.

UNIVERSITY OF MASSACHUSETTS, LOWELL

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Website: http://www.uml.edu/catalog/undergraduate/colleges/engineering/chemical_engineering/nuclear_engineering/default.htm
http://www.uml.edu/sciences/Physics/Radiological_Sciences/Radiological_Health_Physics.html
http://www.uml.edu/MedPhys

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	5	9	11	14	12
Masters	6	15	11	6	11
PhD	2	0	1	1	2

Graduate Student Enrollment: 35 Masters/25 Ph.D.
ABET Accreditation: BS Nuclear Engineering Option, BS Health Physics,
MS Health Physics

Distance Education Program
Offers Nuclear Engineering Courses Online

Nuclear Science and Engineering Faculty

Gilbert J. Brown, Professor (978-934-3166) [Gilbert_Brown@uml.edu] Ph.D., Massachusetts Institute of Technology, 1974. Nuclear workforce development; public acceptance; material characterization; safety energy economics.

Sukesh Aghara, Associate Professor (979-934-4000) [Sukesh_Aghara@uml.edu] Ph.D., The University of Texas at Austin, 2003. Radiation transport; space radiation protection; reactor experiments; radiation protection and shielding.

Partha Chowdhury, Professor (978-934-3730) [Partha_Chowdhury@uml.edu] Ph.D., S.U.N.Y. Stonybrook, 1979. Gamma-ray spectroscopy; nuclear structure.

James Egan, Professor (978-934- 3774) [James_Egan@uml.edu] Ph.D.**,** University of Kentucky**.** Experimental nuclear physics; neutron physics; spectroscopy; detection.

Clayton S. French, Jr., Professor (978-934-3286) [Clayton_French@uml.edu] Ph.D., University of Lowell, 1985. Internal dosimetry; health physics.

Gunter Kegel, Professor (978-934- 3280) [Gunter_Kegel@uml.edu] Ph.D., Massachusetts Institute of Technology. Experimental nuclear physics, radiation effects in materials.

Erno Sajo, Professor (978-934-3288) [Erno_Sajo@uml.edu] Ph.D., University of Lowell , 1989. Radiation transport; medical physics, aerosol physics; radiation biology.

James R. Sheff, Professor (978-934-3169) [James_Sheff@uml.edu] Ph.D.**,** University of Washington **,** 1965**.** Transport phenomena; control systems; separations and laboratory processes.

Mark Tries, Associate Professor (978-934-3353) [Mark_Tries@uml.edu] Ph.D.**,** University of Massachusetts, Lowell, 2000**.** External dosimetry; shielding; radiochemistry.

John R. White, Professor (978-934-3165) [John_White@uml.edu]**,** Ph.D.**,** University of Tennessee **,** 1976**.** Research reactor digital control and data acquisition; computational reactor physics; computer methods; reactor modeling.

Anna N. Yaroslavsky, Associate Professor (978-934-3766) [Anna_Yaroslavsky@uml.edu] Ph.D., Saratov State University, Russia. Multimodal image-guided intervention techniques; Biophotonics.

Other Faculty

Leo Bobek, Adjunct Professor and Nuclear Reactor Supervisor (978-934-3365) [Leo_Bobek@uml.edu] M.S.**,** University of Lowell**.** Research reactor operations.

David C. Medich, Adjunct Professor and Radiation Safety Officer (978-934-3372) [David_Medich@uml.edu] Ph.D., University of Lowell. Radiation Safety; medical physics; MCNP modeling.

Wilfred Ngwa, Adjunct Professor (978-934-3791) [WNGWA@LROC.HARVARD.EDU] Ph.D., University of Leipzig, Germany, 2004. Nanoparticle-aided radiotherapy; Motion management during radiotherapy; pre-clinical radiotherapy; Biophysics.

Thomas Regan, Adjunct Professor and Chief Reactor Operator (978-934-3548) [Thomas_ Regan@uml.edu] M.S., University of Lowell. Research Reactor operations; materials.

Nuclear Science and Engineering Research Centers

The **UMass Lowell Radiation Laboratory** houses a 1 megawatt Research Reactor, a multimega curie Cobalt-60 Irradiation Facility, and a 5.5 MeV Van de Graaf particle accelerator. The Radiation Laboratory provides controlled radiation environments and analytical measurement services to government organizations and to industry. The laboratory also provides facilities for proton, neutron and gamma environments and has been used for pure and applied nuclear physics research, for simulating radiation conditions of hostile space environments, for non-destructive testing and analysis, for research and development of radiation resistant electronics and materials, and for research and development of radiation induced modifications to materials.
Website: http://www.uml.edu/centers/RadLab/default.html

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	12	19	25	21	24
Masters	4	5	10	4	7
PhD	0	2	3	3	4

Graduate Student Enrollment: 22 Masters/15 Ph.D.

Distance Education Program
Offers Nuclear Engineering Courses and Degrees Online
www.unene.ca

Nuclear Science and Engineering Faculty

Dr. Adriaan Buijs (905-525-9140 x24925) **[**buijsa@mcmaster.ca] Ph.D.**,** Utrecht University**,** 1987. The physics of nuclear reactor cores, in particular of heavy-water moderated pressure-tube reactors (CANDU); development of analysis tools for research in reactor physics.
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Nuclear Science and Engineering Research Centers

University Network of Excellence in Nuclear Engineering (UNENE)

Center for Advanced Nuclear System Nuclear Ontario

McMaster Institute for Energy Studies

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	30	28	41	55	53
Masters	15	21	39	27	37
PhD	10	7	10	13	19

Graduate Student Enrollment: 35 Masters/100 Ph.D.
ABET Accreditation: B.S.E. (N.E.R.S)

Nuclear Science and Engineering Faculty

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John E. Foster, Associate Professor (734-764-1976) [jefoster@umich.edu] Ph.D., University of Michigan, 1996. Low-temperature plasma science; propulsion, environmental, energy conversion, and processing plasmas; space and atmospheric plasma phenomena.
Website: http://www.ners.engin.umich.edu

Michael Hartman, Assistant Professor (734-615-5978) [mikehart@umich.edu] Ph.D., University of Michigan, 2005. Application of neutron scattering techniques to study the underlying physical properties of matter; development of high-capacity, reversible, hydrogen storage materials compatible with vehicular fuel cell applications. Website: http://www.ners.engin.umich.edu

Zhong He, Professor (734-764-7130) [hezhong@umich.edu] Ph.D., Southampton University, U.K., 1993. Room-temperature semiconductor gamma-ray detectors and gamma-ray imaging devices. Website: http://www.ners.engin.umich.edu

James P. Holloway, Professor and Associate Dean for Undergraduate Education; Arthur F. Thurnau Professor (734-936-3126) [hagar@umich.edu] Ph.D., University of Virginia, 1989. Radiation transport, reactor physics, plasma kinetic theory, computational physics, nonlinear dynamics.
Website: http://www.ners.engin.umich.edu

Kimberlee J. Kearfott, Professor of Nuclear Engineering and Radiological Sciences and Biomedical Engineering (734-763-9117) [kearfott@umich.edu] Sc.D. and C.H.P.**,** Massachusetts Institute of Technology**,** 1980. Radiation safety, medical physics; radiation detection and dosimetry; environmental radioactivity; explosives detection; homeland security. Website: http://www.ners.engin.umich.edu

Karl M. Krushelnick, Professor (734-763-4877) [kmkr@umich.edu] Ph.D., Princeton University, 1994. Plasma physics; nuclear fusion; high power lasers. Website: http://www.ners.engin.umich.edu

Mark Kushner, Professor (734-647-8148) [mjkush@umich.edu] Ph.D.**,** California Institute of Technology**,** 1979. Applied electromagnetics; MEMS and micrsystems; optics and photonics; quantum science and engineering; integrated circuit design and VLSI; plasma science and engineering; energy and power. Website: http://www.ners.engin.umich.edu

Edward W Larsen, Professor (734-936-0124) [edlarsen@umich.edu} Ph.D.**,** Rensselaer Polytechnic Institute**,** 1971**.** Numerical and analytical methods for neutron, electron, photon, and thermal radiation transport. Website: http://www.ners.engin.umich.edu

Y.Y. Lau, Professor of Nuclear Engineering and Radiological Sciences and Applied Physics Program (734-764-5122) [yylau@umich.edu] Ph.D.**,** Massachusetts Institute of Technology**,** 1973**.** Plasma and beam physics; high power radiation sources; vacuum microelectronics.

John C. Lee, Professor (734-764-9379) [jcl@umich.edu] Ph.D., University of California, Berkeley, 1969. Nuclear reactor physics; reactor safety; power plant simulation and control; fuel cycle analysis. Website: http://www.ners.engin.umich.edu

Annalisa Manera, Associate Professor, Ph.D., Delft University of Technology, The Netherlands, 2003. Experimental two-phase flow, thermal-hydraulics, computational fluid dynamics, and multiphysics methods for power reactor safety analysis. Website: http://www.ners.engin.umich.edu

William R. Martin, Professor (734-764-5534) [wrm@umich.edu] Ph.D.**,** University of Michigan**,** 1976. Computational methods development for the solution of the Boltzmann transport equation including deterministic and Monte Carlo methods. Website: http://www.ners.engin.umich.edu

Sara Pozzi, Associate Professor (734-615-4970) [pozzisa@umich.edu] Ph.D., Polytechnic of Milan, Italy, 2001. Development of new methods for nuclear materials identification and characterization for nuclear nonproliferation and homeland security applications.
Website: http://www.ners.engin.umich.edu

Alexander G.R. Thomas, Assistant Professor, (734-763-6008) [agrt@umich.edu] Ph.D.**,** Imperial College, London, UK**,** 2007**.** High-power laser-plasma interactions, particle accelerators, radiation sources, kinetic plasma computation. Website: http://www.ners.engin.umich.edu

Lumin Wang, Professor (734-647-8530) [lmwang@umich.edu] Ph.D.**,** University of Wisconsin-Madison**,** 1988. Ion beam modification of materials; transmission electron microscopy; nanocrystalline materials; and nuclear materials. Website: http://www.ners.engin.umich.edu

Gary S. Was, Professor of Nuclear Engineering and Radiological Sciences and Materials Science and Engineering; Walter J. Weber, Jr. Professor of Sustainable Energy, Environmental and Earth Systems Engineering (734-763-4675) [gsw@umich.edu] Sc.D., Massachusetts Institute of Technology, 1980. Radiation materials science; materials degradation and design for advanced reactor systems; materials processing with radiation; ion beam modification and analysis of materials; corrosion, stress corrosion cracking, hydrogen embrittlement, materials degradation modes, nuclear fuels and fuel materials. Website: http://www.ners.engin.umich.edu

David K. Wehe, Professor (734-763-1151) [dkw@umich.edu] Ph.D.**,** University of Michigan**,** 1984. Radiation measurements and applications. Website: http://www.ners.engin.umich.edu

Other Faculty

Ziya A. Akcasu, Professor Emeritus of Nuclear Engineering and Radiological Sciences (734-764-5534) [ziya@umich.edu] Ph.D., University of Michigan, 1963.
Nonlinear reactor dynamics; Reactor noise analysis; theory and applications of stochastic differential equations; dynamics of dense fluids; calculation of time-correlations and transport coefficients; dynamics of macromolecular solutions and melts. Particle transport in stochastic media (current).

Yugo Ashida, Assistant Research Scientist (734-763-3940) [yugo@umich.edu] Ph.D.**,** Tohoku University**,** 1999. Mechanism of irradiation assisted stress corrosion cracking in neutron-irradiated stainless steels in light water reactor systems.
Website: http://www.ners.engin.umich.edu

Forrest Brown, Adjunct Professor (505-667-7581) [fbrown@lanl.gov] Ph.D., University of Michigan, 1981. International reputation in Monte Carlo simulation & advanced computing; reactor physics, criticality safety, radiation transport, teraflop & petaflop computers, large-scale engineering computations, parallel/vector computing, distributed computing, computer benchmarking, & computer code development. Website: http://www.ners.engin.umich.edu

Frederick W. Buckman, Adjunct Professor (734-764-4260) [fwb@umich.edu] Ph.D.**,** Massachusetts Institute of Technology**,** 1970**.** Interests are in the design, development, and operation of nuclear power plants; historical performance of plants, people, and the evolution of our licensing and self-assessment processes. Website: http://www.ners.engin.umich.edu

Jeremy Busby, Adjunct Assistant Professor (865-241-4622) [jbusby@umich.edu] Ph.D.**,** University of Michigan**,** 2000. Irradiation effects in metals for high temperature reactors, fusion reactors, and spacecraft reactors, radiation-effects in refractory metals, identifying the mechanisms of embrittlement for materials under high temperature irradiation, irradiation-assisted stress corrosion cracking, radiation-induced microstructure and microchemistry changes, characterization of radiation-induced changes, deformation mechanics, transmission electron microscopy, scanning electron microscopy. Website: http://www.ners.engin.umich.edu

David Chalenski, Assistant Research Scientist, (734-763-0213) [dchalen@umich.edu] Ph.D., Cornell University, 2010. Plasma physics, z-pinches, pulsed power technology.
Website: http://www.ners.engin.umich.edu

Shaun D. Clarke, Assistant Research Scientist (734-615-7830) [clarkesd@umich.edu] Ph.D., Purdue University, 2007. Simulation techniques for active interrogation systems using high-energy photons - methods under investigation include photoneutron energy spectra and multiplicity analysis.
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Jack Davis, Adjunct Professor (202-767-3278) [jack.davis@nrl.navy.mil] Ph.D., Imperial College of Science, London, 1967. Atomic physics, plasma spectroscopy, radiation transport, and non-LTE physics
Website: http://www.ners.engin.umich.edu

James J. Duderstadt, President Emeritus, University of Michigan and University Professor of Science and Engineering (734-647-7300) **[**jjd@umich.edu] Ph.D., California Institute of Technology, 1967. Nuclear reactor theory and design (both fission and fusion); radiation transport theory; kinetic theory and statistical mechanics; interaction of intense laser and particle beams with plasmas; inertial confinement fusion, energy systems analysis; computer simulation and networking; energy policy.
Website: http://www.ners.engin.umich.edu

Marek Flaska, Assistant Research Scientist (734-764-0150) [mflaska@umich.edu] Ph.D.**,** Technical University (TU) Delft**,** 2006**.** Organic and inorganic scintillation detectors; capture-gated detectors; and other detector types for nuclear materials identification for nuclear nonproliferation; nuclear material control and accountability and national security. Website: http://www.ners.engin.umich.edu

Michael Flynn, Adjunct Professor (313-874-4483) [mikef@rad.hfh.edu] Ph.D., University of Michigan, 1975. Radiation imaging with emphasis on medical applications; statistical concepts of image formation for radiography; radioisotope imaging, and computed tomography; measurement methods for image quality assessment; high fidelity image display and human visual perception as pertains to radiological interpretation; active research projects in quantitative lung densitometry, musculo-skeletal tomosynthesis, phase contrast imaging, display calibration, and radiological informatics.
Website: http://www.ners.engin.umich.edu

Mitchell Goodsitt, Adjunct Professor of Nuclear Engineering and Radiological Sciences, Professor of Radiological Sciences Department of Radiology (734-936-7474) [goodsitt@umich.edu] Ph.D., University of Wisconsin, 1982. Medical physicist specializing in research in diagnostic x-ray and ultrasound imaging and quality control such as development of a combined 3D X-ray and 3D ultrasound breast imaging system; diagnostic radiology quality assurance research projects.
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Mark Hammig, Assistant Research Scientist (734-764-5225) [hammig@umich.edu] Ph.D.**,** University of Michigan**,** 2005. Radiation detector development; stochastic systems research; photonic devices.
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Zhijie Jiao, Assistant Research Scientist (734-615-7761) [zjiao@umich.edu] Ph.D., Polytechnic University of New York, 2004. Irradiation-assisted stress corrosion cracking; high temperature corrosion; radiation effects; microstructure evolution under irradiation; transmission electron microscopy; focus ion beam microscopy; atom probe tomography.
Website: http://www.ners.engin.umich.edu

Terry Kammash, Stephen S. Attwood Professor of Engineering and Professor Emeritus of Nuclear Engineering and Radiological Sciences (734-764-0205) [tkammash@umich.edu] Ph.D., University of Michigan, 1958. Theoretical and computational investigations of high temperature plasma confinement in magnetic fusion devices, including the study of equilibrium, transport, and stability of plasma in toroida and open-ended devices; inertial confinement fusion; plasma engineering; power producing fusion reactors; space applications of nuclear energy.
Website: http://www.ners.engin.umich.edu

Glenn F. Knoll, Professor Emeritus of Nuclear Engineering and Radiological Sciences (734-936-0121) [gknoll@umich.edu] Ph.D.**,** University of Michigan**,** 1963. Detection and spectroscopy of ionizing radiation; gamma ray imaging for medical and other applications; three dimensional position sensing in gamma ray spectroscopy, neutron detection and imaging. Website: http://www.ners.engin.umich.edu

Imre Pazsit, Adjunct Professor (46-31-772-3081) [imre@nephy.chalmers.se] Ph.D., Roland Eotvos University, Budapest, 1975. Theory of neutron fluctuations in multiplying materials with application to nuclear material detection and identification; stochastic theory of neutron slowing down, energy deposition and light generation in detectors; solving inverse problems in material identification; deterministic and stochastic transport of neutrons and charged particles; dynamics and diagostics of current and future reactor systems. Website: http://www.ners.engin.umich.edu

Volkan Seker, Assistant Research Scientist (734-764-7286) [vseker@umich.edu] Ph.D.**,** Purdue University**,** 2007. High-temperature gas cooled reactor physics and thermo-fluids; computer code development in nuclear reactor analysis; and parallel and high performance computing.
Website: http://www.ners.engin.umich.edu

Dieter Vincent, Professor Emeritus of Nuclear Engineering and Radiological Sciences (734-936-1592) [dvincent@umich.edu] Ph.D., Universitaet Goettingen, 1956. Radiation effects in materials, hydrogen (and helium) in metals; ion beam analysis; moessbauer spectroscopy; positron lifetime spectroscopy. Website: http://www.ners.engin.umich.edu

Ruth Weiner, Adjunct Assistant Professor (505-284-8406) [rfweine@sandia.gov] Ph.D.**,** Johns Hopkins University**,** 1962. Radiation risk analysis; radioactive waste management., transportation and storage of radioactive materials. Website: http://www.ners.engin.umich.edu

Louise Willingale, Assistant Research Scientist (734-763-4980) [wlouise@umich.edu] Ph.D., Imperial College, UK, 2007. Ultrahigh-intensity laser-plasma interactions, laser propagation through underdense and near-critical density plasmas, ion and electron acceleration.
Website: http://www.ners.engin.umich.edu

Feng Zhang, Assistant Research Scientist (734-615-6890) [zhangf@umich.edu] Ph.D.**,** University of Michigan**,** 2004. Radiation measurements and applications.
Website: http://www.ners.engin.umich.edu

Nuclear Science and Engineering Research Centers

MCASL Center: the University of Michigan branch of CASL, the Consortium for Advanced Simulation of Light Water Reactors (LWRs) that is centered at Oak Ridge National Laboratory. CASL was established in 2010 as a ten-institution partnership to create a virtual reactor (VR) for predictive simulation of LWRs. The partnership includes three universities (Michigan, MIT and NC State), four national labs (Oak Ridge, Los Alamos, Sandia, and Idaho), a reactor manufacturer (Westinghouse), a reactor owner/operator (TVA), and the research arm of the nuclear utility industry (Electric Power Research Institute). The MCASL Center includes faculty, PhD students, and postdoctoral fellows from four engineering departments: NERS, Aerospace, Mechanical Engineering, and Materials Science and Engineering. MCASL faculty are involved in development of advanced computational methods for analysis of coupled nuclear reactor phenomena including neutron transport, thermal/hydraulics, materials performance, and validation of these methods against experimental data. A detailed description of CASL is available at http://www.casl.gov .

High Temperature Corrosion Laboratory (HTCL) : The High Temperature Corrosion Laboratory (HTCL) provides the capability to conduct corrosion, stress corrosion cracking, and hydrogen embrittlement tests in high temperature aqueous environments and, in particular, simulated light water reactor environments. http://www-ners.engin.umich.edu/labs/htcl/

Irradiated Materials Testing Complex (IMTL): The Irradiated Materials Testing Laboratory provides the capability to conduct high temperature corrosion and stress corrosion cracking of neutron irradiated materials and to characterize the fracture surfaces after failure.
http://www-ners.engin.umich.edu/labs/imtl/

Materials Preparation Laboratory: The Materials Preparation Laboratory provides facilities for the preparation and characterization of materials for materials research studies. The lab houses a grinding and polishing table for metallographic sample preparation, a tube furnace for annealing and heat treating, an electropolishing and etching system, a jet-electropolisher for making TEM disc samples, a slow speed cut-off wheel, a slurry drill, and a microscope and camera for imaging sample surfaces.
http://www.mse.engin.umich.edu/research/facilities/139

Metastable Materials Laboratory: In the Metastable Materials Laboratory, studies of the kinetics and thermodynamics of nanocrystalline and amorphous materials are conducted. The lab is equipped with facilities for x-ray diffraction, calorimetry, mechanical alloying, and annealing of samples.

Michigan Ion Beam Laboratory (MIBL): The Michigan Ion Beam Laboratory for Surface Modification and Analysis (MIBL) was completed in October of 1986. The laboratory was established for the purpose of advancing our understanding of ion-solid interactions by providing up-to-date equipment with unique and extensive facilities to support research at the cutting edge of science. Researchers from the University of Michigan as well as industry and other universities are encouraged to participate in this effort. http://www-ners.engin.umich.edu/labs/mibl/

Neutron Science Laboratory: The Neutron Science Laboratory provides a hands-on neutron measurement experience for students within NERS. The lab is equipped with D-D and a D-T neutron generators with a capability of ~1E06 and ~1E10 neutrons/sec, respectively. The neutron generators are also available for researcher in NERS and elsewhere within the University who require a neutron radiation field for the conduct of their research.

Plasma, Pulsed Power and Microwave Lab: The purpose of this lab is to investigate the fundamental physics and technology of interactions between beams of electrons, ions, plasma, microwaves, laser light and radio frequency radiation with plasmas, materials, structures, and biological cells. Numerous state-of-the-art, high-power accelerators, lasers, high power microwave sources, and diagnostic instrumentation are utilized in this research. http://www-ners.engin.umich.edu/labs/plasma/

Plasma Science and Technology Laboratory: The Plasma Science and Technology Laboratory's focus is on understanding and applying plasma science to real world problems. The lab has four major thrust areas: plasma space propulsion, plasma processing, environmental mitigation, and energy conversion.

Particular attention is paid to those applications that protect the environment and those that improve the quality of life in underdeveloped countries. http://www-ners.engin.umich.edu/lab/pstlab/

Position Sensing Semiconductor Radiation Detector Lab: The Position-Sensing Semiconductor Radiation Detector Laboratory is dedicated to the development of room-temperature semiconductor radiation detectors. The focuses of research include the design of advanced semiconductor-based gamma and neutron spectrometers, ultra- low noise Application Specific Integrated Circuitries (ASICs), real- time gamma-ray imaging reconstruction algorithms, and real-time nuclear isotope detection techniques. These instruments are being developed for applications in nuclear non-proliferation, homeland security, astrophysics, planetary sciences, medical imaging, high- energy physics experiments. http://czt-lab.engin.umich.edu/

Radiation Detection Laboratory: The Detection for Nuclear Nonproliferation Lab is used to explore novel techniques for radiation detection and characterization for nuclear nonproliferation and homeland security applications. In addition, we study the detailed response of liquid and plastic sintillaction detectors in the presence of neutron and gamma-ray sources. The laboratory is equipped with detection systems, electronics, and fast (GHz) digitizers for pulse acquisition. Pulse analysis is performed on several PC's. http://www-ners.engin.umich.edu/labs/dnng/

Radiation Effects and Nanomaterials Lab: The Radiation Effects and Nanomaterials Laboratory is for the preparation and analysis of materials for the study of radiation effects and nanoscience/technology. The laboratory facilities include: a Regarku Miniflex x-ray diffractometer (XRD), a high temperature furnace, a Gatan precision ion polishing (PIPS) workstation, an ultramicrotomy workstation, a carbon coater, and other standard equipment for TEM sample preparation.

Radiation Imaging Laboratory: The Radiation Imaging Laboratory's goal is to develop high- energy gamma ray imaging systems for industrial, space, homeland security, and medical applications. The laboratory explores the fundamental properties of nuclear radiation detectors, develops novel pulse processing electronics, simulates, builds and tests unique radiation measurement systems, and explores new ideas in radiation image formation and reconstruction.
http://www-ners.engin.umich.edu/labs/radmeas/

Radiological Health Engineering Laboratory: The Radiological Health Engineering (RHE) Laboratory includes equipment and space for the development and testing of new instruments and systems for application to specific radiological health problems. Work is concentrated on practical systems and radiation measurements methods deployable within the immediate future. Work is conducted in novel detector and dosimeter design, as well as improvements in measurement methods for medical, industrial, laboratory and nuclear power radiation safety applications.
http://www-ners.engin.umich.edu/rhelab/

Center for Ultrafast Optical Science (CUOS): The Center for Ultrafast Optical Science (CUOS) is an interdisciplinary research center in the College of Engineering at the University of Michigan in Ann Arbor. CUOS was sponsored as a Science and Technology Center by the National Science Foundation

during 1990-2001, and as a College of Engineering Center continues its research in ultrafast optics with funding from a variety of government agencies and industry. Its mission is to perform multidisciplinary research in the basic science and technological applications of ultrashort laser pulses, to educate students from a wide variety of backgrounds in the field, and to spur the development of new technologies. http://www.eecs.umich.edu/CUOS/

Electron Microbeam Analysis Laboratory (EMAL): The University of Michigan Electron Microbeam Analysis Laboratory (EMAL) is a university-wide user facility for the microstructural and microchemical characterization of materials. Being a user facility, EMAL is open to anyone in the University research community. The laboratory is also open to users from other universities and to users from local industry. http://www.emal.engin.umich.edu/

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	n/a	n/a	n/a	n/a	n/a
Masters	19	12	8	6	10
PhD	4	3	2	8	6

Graduate Student Enrollment: 33 Masters/36 Ph.D.
ABET Accreditation: MS and PhD degree in Medical Physics

Distance Education Program
Offers Nuclear Engineering Courses Online
http://mudirect.missouri.edu/degprog/specialized/_homeland.shtm

Nuclear Science and Engineering Faculty

Mark A. Prelas, Professor & Director of Research (573-882-9691) [prelasm@missouri.edu] Ph.D**.** University of Illinois Urbana Champaign**,** 1979**.** Radiation damage; diamond and related materials; direct energy conversion; radiation detection; molecular sensors; directed energy; non proliferation; risk management**.** Professional Engineer. Website: http://prelas.nuclear.missouri.edu/

Tushar Ghosh, Director of Graduate Studies and Professor (573-882-9736); [GhoshT@missouri.edu]; Ph.D. Oklahoma State University 1989; High temperature adsorption of fission products, Diffusion of fission products in graphite—experimental and theoretical investigation, adsorption phenomena in biochemical systems, kinetics and reaction mechanisms of catalytic reactions, nuclear waste treatment.

Sudarshan K. Loyalka, Curators' Professor, Professor, and Director of Particulate Systems Research Center (573-882-8201); [LoyalkaS@missouri.edu] Ph.D., Stanford University, 1967; Kinetic theory of gases, Diffusion of fission products in graphite, neutron transport, mechanics of aerosols, physics and thermal hydraulics of nuclear reactors, reactor safety analysis.

Robert V. Tompson, Associate Professor (573-882-2881); [TompsonR@missouri.edu]; Ph.D. University of Missouri 1988; Kinetic theory of gases, experimental and theoretical aerosol mechanics, neutron transport theory, nuclear reactor physics and safety, lasers and laser applications, materials.

Other Faculty

William H. Miller, Professor and Director of Energy Systems and Resources Program, Emeritus (573-882-9692); [MillerW@missouri.edu]; Ph.D. University of Missouri 1976; Detectors and digital instrumentation, radiation-based analytical techniques, proton recoil neutron spectrometers, energy systems, public information.

Nuclear Engineering Research Centers

Particulate Systems Research Center: Aerosol mechanics, dynamics, interactions; Particulate production; nuclear safety, very high temperature reactor fuels.

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	29	25	20	23	34
Masters	2	7	3	9	8
PhD	0	0	1	0	0

Graduate Student Enrollment: 8 Masters/19 Ph.D.
ABET Accreditation: BS Nuclear Engineering

Nuclear Science and Engineering Faculty

Arvind S. Kumar, Professor & Program Chair **(**573-341-4747) [kumar@mst.edu]
Ph.D., University of California-Berkeley, 1977. Nuclear materials, radiation effects, mechanical properties, nuclear plant life extension. Website:
http://nuclear.mst.edu/facultystaffandfacilities/kumar/

Muthanna H. Al-Dahhan, Professor (573-341-7518) [aldahhanm@mst.edu]
Doctoral degree, Washington University in St. Louis, 1993. Advanced process measurement and monitoring techniques; Radiometric techniques and applications of radioisotopes and nuclear technology in industrial process imaging and visualization; 4th generation nuclear energy and related topics; Multiphase reaction engineering, reactors and processes via advanced measurement, modeling and computational techniques; modeling of transport (momentum, mass, heat) – kinetic interactions; energy efficient and environmentally responsible design, scale-up and performance of multiphase reactors and flow systems; sustainable development via advancing the knowledge and investigating various multiphase processes related to sustainable energy and environment, production of clean energy, bio-energy, fuels, chemicals, and petrochemicals, petroleum processes, biomass and coal conversion and their clean utilization, wastes treatment, animal and farm wastes treatment via anaerobic digestion, environmentally responsible and risk free proliferation nuclear energy, etc.

Carlos H. Castano, Assistant Professor (573-341-6766) [castanoc@mst.edu] Ph.D., Nuclear Engineering**,** University of Illinois at Urbana Champaign**,** 2007**.** Hydrogen in Materials; Materials for Nuclear Engineering; Plasma Material Interactions.

Website: http://nuclear.mst.edu/facultystaffandfacilities/castano.html

Hyoung Koo Lee, Assistant Professor (573-341-4585) [leehk@mst.edu] Ph.D., University of California-Berkeley, 1995. Radiation Imaging; Neutron Radiography; Neutron CT; X-ray CT; Non-Destructive Evaluation (NDE) of TRISO Fuel; NDE of Graphite Block; Medical Imaging; Digital Radiography; Digital Mammography; Digital Fluoroscopy; Cone-Beam CT; New X-ray Source; Digital Image Processing
Website: http://nuclear.mst.edu/facultystaffandfacilities/lee.html

Gary E. Mueller, Associate Professor (573-341-4348) [gmueller@mst.edu] Ph.D., University of Missouri, Rolla, 1980. Particle Bed Characterization; Radio-Turbulence; Nuclear Power Safety. Professional Engineer. Website: http://nuclear.mst.edu/faculty/staffandfacilities/mueller.html

Shoaib Usman, Associate Professor **(**573-341-745) [usmans@mst.edu] Ph.D., University of Cincinnati, 1997. Radiation measurement and effects on materials, detector characterization, spent fuel interrogation and safeguards, natural convection, turbulence and dispersion, micro convection and radiation effects on fluids. Website: http://nuclear.mst.edu/facultystaffandfacilities/usman.html

Other Faculty

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Ph.D., Georgia Tech, 1996. Nuclear desalination; Thermal and membrane desalination; Renewable energy; Nuclear and non nuclear tomography techniques; Radiation detection and measurement.

Mariesa Crow, F. Finley Distinguished Professor (573-341-6305) [crow@mst.edu]
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Delbert E. Day, Curators Professor Emeritus **(**573-341-4354) [day@mst.edu]
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Tod Moser, Adjunct Professor (573-823-9253) [tmoser@ameren.com] MSNE**,** University of Missouri – Columbia**,** 1992**.** Professional Engineer.

Nuclear Science and Engineering Research Centers

The Nuclear Reactor: The Missouri S&T Nuclear Reactor is a Nuclear Regulatory Commission (NRC) licensed 200 kilowatt pool-type reactor that is used to support the engineering and science activities on campus. Using the facility, the reactor staff provides hands-on laboratory, research and development, and project opportunities. The reactor uses uranium fuel and is cooled by either natural convection or a forced cooling system in a pool containing approximately 30,000 gallons of water. The open pool design allows access to the reactor core where experiments and samples to be irradiated can be positioned. The facility is equipped with a pneumatics sample irradiation system, a neutron beam port that provides a collimated neutron beam, a thermal column, and an internet accessible hot

cell. The reactor is open to the greater campus community and offers an active (operations) licensure program for interested students and others.

Radiation Measurements and Spectroscopy Laboratory (RMSL): The Nuclear Engineering RMSL is equipped with NIM standard electronic units, neutron and gamma scintillation detectors, solid-state detectors, coincidence electronics, and multi-channel analyzers connected to PCs for automated data analysis. The laboratory also includes two portable EG&G HPGe detectors, a Canberra Thermoluminescent dosimeter with state-of-the-art electronics and software, and a Lynx digital data analysis system for remote web-based experimental capacity.

Graduate Center for Materials Research: The facilities of the Graduate Center for Materials Research, and metallurgical engineering and nuclear engineering departments are available for nuclear materials-related research. The Nuclear Materials Lab allows for use of instruments such as a scanning electron microscope, a 300 keV EM-430 Phillips transmission electron microscope, an atomic absorption spectrometer, and a quadrupole mass spectrometer.

Internet-Accessible Hot Cell Facility: A dual-chambered internet-accessible heavily shielded facility with pneumatic access to the 200 kW Research Nuclear Reactor (MSTR) allows authorized distance users to remotely manipulate and analyze neutron irradiated samples. The system consists of two shielded compartments, one for multiple sample storage, and the other dedicated exclusively for radiation measurements and spectroscopy. The second chamber has multiple detector ports, with graded shielding, and has the capability to support gamma spectroscopy using radiation detectors such as a HPGe detector. Both these chambers are connected though a rapid pneumatic system with access to the MSTR nuclear reactor core. The total transportation time between the core and the hot cell is less than 3.0 second.

Two-phase Flow and Thermal-Hydraulics Laboratory (TFTL): The Nuclear Engineering TFTL is designed to perform both fundamental and advanced two-phase flow experiments simulating prototypic nuclear reactor conditions. The TFTL is equipped with state-of-the-art instrumentation such as a micro multi-sensor conductivity probe, a high-speed digital motion-corder, various flow measurement devices, and a data acquisition system and software. Topics of research studied in the TFTL include advanced two-phase flow modeling, two-phase flow characterization in various flow channel geometries, air-water two-phase bubble jet experiment, secondary flow analysis in liquid film flow, and development of two-phase flow instrumentation.

Advanced Radiography and Tomography Lab (ARTLAB): The Nuclear Engineering ARTLAB is designed to perform radiation imaging for medical or industrial purpose. Students have opportunities of running Monte Carlo simulation codes for radiation imaging systems and experimenting with digital x-ray radiography, x-ray computed tomography (CT), neutron radiography, neutron CT, etc. The technologies developed in the lab can be applied to either medical imaging or non-destructive inspection of various materials or objects including nuclear fuel rods and plates. On-going researches include flat-panel x-ray source for imaging, neutron and x-ray combined CT, and digital image processing.

Neutron Generator Laboratory: The neutron generator laboratory has a D-D neutron generator that produces approximately 109 neutrons/sec. The neutron generator is available for both graduate and undergraduate research and education at Missouri S&T. Examples of research using the neutron generator are reactor kinetics research, the study of two-phase flow, research in nuclear forensics and radiochemistry, particle tracking in complex flows, and the photon-neutron tomography for mechanical testing of structural materials.

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ABET Accreditation: Mechanical Engineering, Naval Architecture, Ocean Engineering, Aerospace Engineering, Systems Engineering

Nuclear Science and Engineering Faculty

Marshall G. Millett, Assistant Professor [mmillett@usna.edu] Ph.D., University of Maryland, 1997. Radiation transport and detection modeling, detection algorithms, radiation detection in homeland security. Professional Engineer.

Mark Murray, Associate Professor (410-293-6451) [mmmurray@usna.edu] Ph.D., Duke University, 2000. Reactor plant operations, dosimetry, radiation detection, heat transfer and fluid flow.

Martin E. Nelson, Professor (410 293-6427) [nelson@usna.edu] Ph.D., University of Virginia**,** 1972**.** Dosimetry, radiation detection and measurment, radiation effects on microelectronics, radiation transport. Professional Engineer.

Nuclear Science and Engineering Research Centers

Rickover Hall Nucelonics Laboratory-subcritical reactor

D-T and D-D MeV neutron generators

Nuclear workstations

UNIVERSITY OF NEVADA, LAS VEGAS

Department of Mechanical Engineering
4505 South Maryland Parkway, Box 4027
Las Vegas, NV 89154-4027
(702) 895-1331
FAX: (702) 895-4569
Administrative Contact: William Culbreth
(720) 895-3426
William.Culbreth@unlv.edu
Website: me.unlv.edu

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	0	0	0	0	0
Masters	1	3	2	1	4
PhD	1	1	1	0	1

Graduate Student Enrollment: 3 Masters/3 Ph.D.

Nuclear Science and Engineering Faculty

William G. Culbreth, Associate Professor (702-895-3426) [William.Culbreth@unlv.edu] Ph.D., University of California, Santa Barbara, 1981. Dense Plasma Focus; Nuclear Detection; Radiation Transport.

Nuclear Science and Engineering Research Center

Lead Bismuth Loop Facility

UNIVERSITY OF NEW BRUNSWICK

Mechanical Engineering
P.O. Box 4400
Fredericton, NB E3B 5A3
506-447-3105
FAX: 506 -453-5025
Administrative Contact: Esam Hussein
506-447-3105
hussein@unb.ca
Website: http://www.unb.ca/fredericton/engineering/depts/mechanical/

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	3	3	4	0	0
Masters	2	2	2	2	1
PhD	0	0	0	0	1

Graduate Student Enrollment: 2 Masters/1 Ph.D.
ABET Accreditation BScE

Nuclear Science and Engineering Faculty

Esam MA Hussein, Professor & Associate Dean (506-447-3105) [hussein@unb.ca]
PhD, McMaster University, 1983. Nuclear Methods for Nondestructive Testing & Imaging, Inverse Problems and Monte Carlo Methods. Professional Engineer
Website: http://www.unb.ca/fredericton/engineering/depts/mechanical/people/hussein.html/

Nuclear Science and Engineering Research Centers

Laboratory for Threat Material Detection: using atomic/nuclear radiation to detect and characterize concealed objects.

UNIVERSITY OF NEW MEXICO

Chemical & Nuclear Engineering
MSC01 1120, 1 University of New Mexico
Albuquerque, NM 87131-0001
505-277-5431
FAX: 505-277-5433
Administrative Contact: Timothy L Ward
505-277-2067
tlward@unm.edu
Website: www-chne.unm.edu

	07/07-06/08	07/08-6/09	7/09-6/10
B.S.	12	7	10
Masters	7	8	9
PhD	3	5	0

Graduate Student Enrollment: 19 Masters/21 Ph.D.
ABET Accreditation: BS in ChE and BS in NE

Distance Education Program
Offers Nuclear Engineering Courses Online
www-chne.unm.edu

Nuclear Science and Engineering Faculty

Anil K. Prinja, Professor and Associate Chair (505-277-4600) [prinja@unm.edu] Ph.D., Queen Mary College, University of London, U.K., 1980. Stochastic theory of neutron populations; theory and modeling of high-energy charged particle transport; stochastic uncertainty quantification techniques for radiation transport. Website: www.chne.unm.edu

Edward D. Blanford, Assistant Professor (505-277-7964) [edb@unm.edu] Ph.D., University of California, Berkeley, 2010. Thermal-hydraulics; reactor safety; advanced reactor design; probabilistic risk analysis.

Gary W. Cooper, Associate Professor (505-277-2557) [garywc@unm.edu] Ph.D., University of Illinois, 1976. Neutron diagnostics of fusion plasmas. Website: www-chne.unm.edu

Cassiano R. E. de Oliveira, Professor **(**505-277-5661**) [**cassiano@unm.edu**]** Ph.D., University of London, 1987. Computational nuclear science; deterministic and stochastic radiation transport; reactor physics methods; nuclear criticality safety; radiation shielding and dosimetry; high performance computing; advanced numerical discretization methods; data assimilation and optimization methods. Website: http://www-chne.unm.edu/faculty/oliveira/oliveira.htm

Mohamed S. El-Genk Regents' Professor, Chemical, Nuclear and Mechanical Engineering (505-277-5442) [mgenk@unm.edu] Ph.D. Nuclear reactors neutronics analysis, design, thermal-hydraulics and safety; nuclear fuel and fuel cycle; energy conversion; space nuclear power and propulsion; radiation shielding of space energetic particles; thermal management and energy storage; heat pipes; CFD analysis of advanced reactors and complex systems; boiling heat transfer and two-phase flow; advanced cooling of electronics; and fluid flow and heat transfer in micro-systems.

Adam A. Hecht, Assistant Professor (505-277-1654) [hecht@unm.edu] Ph.D.**,** Yale University**,** 2004**.** Radiation detection and measurement with work in nuclear nonproliferation; experimental work in array detection techniques to extract further radioactive source information; calculational work expanding Monte Carlo simulations to fission for use in active interrogation radiation detection; deasurement work on fission output for a range of interrogation beams; investigating properties of novel materials for radiation detection and spectroscopy. Website: www.unm.edu/~hecht

Other Faculty

Robert D Busch, Lecturer III (505-277-8027) [busch@unm.edu] Ph.D.**,** University of New Mexico**,** 1976**.** Nuclear criticality safety; reactor physics measurements; laboratory educational techniques**.** Professional Engineer.

Norman F. Roderick, Professor Emeritus (505-277-2209) [roderick@unm.edu] Ph.D. The University of Michigan**,** 1971**.** High energy density physics; fusion; plasma physics.

Nuclear Science and Engineering Research Centers

AGN Reactor, Small sample reactivity measurements and rossi-alpha measurements.

Center for Nuclear Nonproliferation Science and Technology: Interdisciplinary center promoting class and lab coursework and laboratory research.

Nuclear nonproliferation research laboratory: For work on radiation detection materials and techniques, with capabilities in multichannel digital data acquisition, high vacuum and controlled gas environments.

NORTH CAROLINA STATE UNIVERSITY

Department of Nuclear Engineering
2500 Stinson Dr.
Raleigh, NC 27695
919.515.2301
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919.515.3385
yyazmy@ncsu.edu
Website: http://www.ne.ncsu.edu/

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	19	24	20	21	32
Masters	16	13	9	12	6
PhD	5	5	1	3	9

Graduate Student Enrollment: 49 Masters/50 Ph.D.
ABET Accreditation: BS

Distance Education Program
Offers Nuclear Engineering Courses and Degrees Online
http://engineeringonline.ncsu.edu/PS/grad_degrees.html

Nuclear Science and Engineering Faculty

Yousry Y. Azmy, Professor & Head (919-515-3385) [yyazmy@ncsu.edu] Ph.D., University of Illinois, Urbana-Champaign, 1985. Nuclear computational Science. Computational transport theory. Multiprocessing. Website: http://www.ne.ncsu.edu/faculty/azmy.html

Hany S. Abdel-Khalik, Assistant Professor (919-515-4600) [abdelkhalik@ncsu.edu] Ph.D., North Carolina State University, 2004. Verification and Validation of Complex Models; Multi-scale Multi-physics Modeling; Sensitivity Analysis; Uncertainty Quantification; Data Assimilation. Website: http://www.ne.ncsu.edu/faculty/abdelkhalik/abdelkhalik.html

Dmitriy Y. Anistratov, Associate Professor (919-513-4353); [anistratov@ncsu.edu] Ph.D., Mathematical and Physical Sciences Institute for Mathematical Modeling, Russian Academy of Sciences, 1993. Computational physics, transport theory, numerical analysis. Website: http://www.ne.ncsu.edu/faculty/anistratov.html

Mohamed A. Bourham, Professor (919-515-7662) [bourham@ncsu.edu] Ph.D., Ain Shams University, Cairo Egypt, 1976. Plasma-matter interaction, plasma diagnostics, plasma-driven Launch Technology, fusion engineering and technology, plasma dynamics, plasma propulsion and space thrusters, industrial and atmospheric plasmas, physics of low temperature and non-ideal plasmas, physics of beams, particle accelerators and electron beam irradiation systems, atmospheric and industrial plasmas, x-ray sources for medical and screening imaging. Website: http://www.ne.ncsu.edu/faculty/bourham.html

Nam Dinh, Professor (919-515-5421) [ntdinh@ncsu.edu] Ph.D., Moscow Power Engineering Institute, 1991. Mechanistic modeling and analysis of multi-phase thermal-fluid phenomena of importance to nuclear reactor design and safety.

Joseph M. Doster, Professor (919-515-3658) [doster@ncsu.edu] Ph.D., North Carolina State University, 1982. Systems dynamics, systems simulation, Computational methods in two-phase flow, Systems simulation in support of advanced control and diagnostic systems, design and optimization of advanced targetry for the cyclotron production of radiopharmaceuticals.
Website: http://www.ne.ncsu.edu/faculty/doster.html

Jacob Eapen, Assistant Professor (919-515 5952) [jacob.eapen@ncsu.edu] Sc.D., MIT, 2006. Molecular and Multiscale Simulations, Nuclear Materials, Radiation Interactions with Materials, Computational Material Science, Thermal and Fluid Transport. Website: http://www.ne.ncsu.edu/faculty/eapen.html

Robin P. Gardner, Professor of Nuclear & Chemical Engineering and Director of Center for Engineering Applications of Radioisotopes (919-515-3378) [gardner@ncsu.edu] Ph.D., The Pennsylvania State University, 1961. Industrial Radiation and Radioisotope Measurement Applications including: Radioisotope Tracers; Radiation Gauges; Radiation Analyzers; Monte Carlo Simulation of Previous Three; and Radiation Detection. Professional Engineer.
Website: http://www.ne.ncsu.edu/faculty/gardner.html

John G. Gilligan, Professor and Director of the Nuclear Energy University Programs Integration Office for the US DOE (919-513-7144) [john_gilligan@ncsu.edu] Ph.D., University of Michigan, 1977. High power density plasma modeling and applications; Fission and fusion energy systems; Engineering education programs and methods. Website: http://www.ne.ncsu.edu/faculty/gilligan.html

Ayman I. Hawari, Professor of Nuclear Engineering, Director of Nuclear Reactor Program (919-515-4598) [ayman.hawari@ncsu.edu] Ph.D.,University of Michigan, 1995. Neutron thermalization; slow neutron scattering models and atomistic simulations; Nondestructive examination with slow neutron and positron beams; Neutron imaging; Radiation measurements; Nuclear materials assay; Research reactors and accelerator-based neutron sources.
Website: http://www.ne.ncsu.edu/faculty/hawari.html

John K. Mattingly, Associate professor (919-515-0224) [john_mattingly@ncsu.edu] Ph.D., University of Tennessee, Knoxville, 1998. Research focus on developing active neutron interrogation methods that employed time-correlation signatures using fast organic scintillators. The principal objective was to estimate bulk SNM properties like fissile mass and multiplication to enable monitoring and surveillance

of SNM production, use, storage, movement, and disposition activities to help foster transparency in NMC&A, safeguards, arms control, and nonproliferation.
Website: http://www.ne.ncsu.edu/faculty/mattingly.html

Korukonda L. Murty, Professor and Director of Graduate Programs (919-515-3657) [murty@ncsu.edu] Ph.D., Cornell University 1970. Nuclear materials, radiation effects, mechanical properties, creep, fatigue and fracture mechanics, processing and characterization of nanograin structured metals, NDE, NMR. Website: http://www4.ncsu.edu/~murty

Steven C. Shannon, Associate Professor (919-515-3292) **[**scshannon@ncsu.edu] Ph.D., University of Michigan, 1999. Industrial plasma applications; plasma diagnostics; radiation/material interaction; nanofabrication; compact neutron generators for low fluence applications.
Website: www4.ncsu.edu/~scshanno

Paul J. Turinsky, Professor (919-515-5098) [turinsky@ncsu.edu] Ph.D., Univerity of Michigan, 1970. Computational reactor physics; nuclear fuel management and mathematical optimization; validation and verification of software; uncertainty quantification; data assimilation and optimum experimental design; adaptive model refinement; multiphysics simulation.
Website: http://www.ne.ncsu.edu/faculty/turinsky.html

Other Faculty

Donald J. Dudziak, Professor Emeritus (505-667-7983) (505-661-3832) [dudziak@ncsu.edu, dudziak@lanl.gov] Ph.D.,Univ. of Pittsburgh, 1963. Photon transport in media, nuclear facility shielding, dose assessment and cost/benefit analysis, radiation dose regulation policy. Professional Engineer.

David N. McNelis, Adjunct Professor (919-966-9923)[mcnelis@unc.edu] Ph.D., UNC at Chapel Hill, 1974. Nuclear Fuel Cycle (transmutation; separation; aqueous and pyroprocessing; non proliferation; integrated waste management; thermal loading of repository)

Avneet Sood, Adjunct Assistant Professor (505-667-2119) [sooda@lanl.gov] Ph.D., North Carolina State University, 2000. Monte Carlo methods and code development for radiation transport; Application of radiation transport codes to radiation detection problems.

Bernard W. Wehring, Research Professor (retired, University of Texas at Austin) (919 515-4599) [bwwehrin@ncsu.edu] Ph.D., Nuclear Engineering, University of Illinois at Urbana Champaign, 1966. Radiation Science; Neutron and Fission Physics.

Gerald Wicks, Reactor Health Physicist and Lecturer (919-515-4601) [wicks@ncsu.edu] M.S., University of Lowell, 1983.

Nuclear Science and Engineering Research Centers

Nuclear Reactor Program operates the 1MW PULSTAR with the following major experimental facilities: Positron Annihilation Spectroscopy, Ultracold neutron source, neutron diffractometer, neutron imaging

Center for Engineering Applications of Radioisotopes (CEAR)

CASL Modeling & Simulation Hub
Chief Scientist: Paul J. Turinsky
Website: www.casl.gov

OHIO STATE UNIVERSITY

Nuclear Engineering Graduate Program
201 West 19th Avenue
Columbus, OH 43210
614-292-8519
Administrative Contact: Megan BeVier
614-292-8519
bevier.12@osu.edu
Website: http://mae.osu.edu/nuclear

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	n/a	n/a	n/a	n/a	n/a
Masters	14	8	4	5	10
PhD	0	0	4	3	1

Graduate Student Enrollment: 16 Masters/20 Ph.D.
ABET Accreditation: B.Sc. in Engineering with Nuclear Minor

Nuclear Science and Engineering Faculty

Tunc Aldemir, Professor (614-292-4627) [aldemir.1@osu.edu] Ph.D., University of Illinois, 1978. Nuclear reactor safety; probabilistic risk assessment; smart sensors, plant aging, maintenance and on-line monitoring; digital instrumentation and control systems.
Website: http://www.mecheng.osu.edu/people/tunc-aldemir

Thomas E. Blue, Professor (614-292-0629) [blue.1@osu.edu] Ph.D., University of Michigan, 1978. Space nuclear systems; advanced nuclear reactor instrumentation, including semiconductor sensors, static and dynamic characterization of radiation-induced degradation of semiconductor power devices; radiation hardness testing; fiber-optics; workforce challenges/education for the nuclear industry.
Website: http://www.mecheng.osu.edu/people/thomas-blue

Lei (Raymond) Cao, Assistant Professor (614-247-8701) [cao.152@osu.edu] Ph.D.**,** The University of Texas at Austin**,** 2007. Nuclear instrumentation; development of semiconductor neutron sensors; radiation detection; nuclear analytical technologies (PGAA, NDP and neutron radiography); reactor design**.** Website: https://www.mecheng.osu.edu/people/raymond-cao

Carol S. Smidts, Professor (614-292-6727) [smidts.1@osu.edu] Ph.D., Universite Libre de Bruxelles, Belgium, 1991. Reliability Engineering; Probabilistic Risk Assessment; Software Reliability; Software Safety; Dynamic Risk Assessment; Human Reliability; Digital Systems Risk and Reliability.
Website: http://www.mecheng.osu.edu/people/carol-smidts

Xiaodong Sun, Assistant Professor (614-247-7646) [sun.200@osu.edu] Ph.D., Purdue University**,** 2001. Thermal hydraulics and reactor safety; two-phase flow experimentation, modeling, and numerical simulation; boiling and condensation; interfacial area transport and bubble dynamics; thermal hydraulics in high-temperature reactors**.**
Website: https://www.mecheng.osu.edu/people/xiaodong-sun

Other Faculty

Richard N. Christensen, Professor Emeritus (614-292-0445); [christensen.3@osu.edu]; Heat transfer, boiling and condensation, nuclear energy, inherently safe reactors and passive safety systems.
Website: www.nuclear.osu.edu

Richard S. Denning, Visiting Professor (614-292-2544) [denning.8@osu.edu] Ph.D., University of Florida, 1967. Dynamic PRA; Severe accident behavior (LWR and SFR); Fire PRA.
Website: www.nuclear.osu.edu

Brian K. Hajek, Instructor and Associate Chair **(**614-292-5405) [hajek.1@osu.edu] M.Sc., The Ohio State University, 1972. Reactor operations and regulation, licensing and safety; personnel training/workforce development; computerized procedure development and implementation; simulator modeling including Human-Machine Interface (HMI); nuclear fuel cycle. Website: nuclear.osu.edu

Steven J. Maheras, Lecturer (614-486-5350) [Maheras.1@osu.edu] Ph.D., Colorado State University**,** 1988**.** Health physics; radioactive waste management; decontamination and decommissioning; transportation risk assessment; radiological and nuclear terrorism; and radiation dose reconstruction.

Don W. Miller, Professor Emeritus **(**614-292-7979) [miller.68@osu.edu] Ph.D., The Ohio State University**,** 1971**.** Reactor instrumentation, reactor dynamics and control; nuclear medical instrumentation; dynamic safety systems; safety critical software; digital x-ray radiography.
Website: nuclear.osu.edu

Nuclear Science and Engineering Research Centers

The Ohio State University Nuclear Reactor Laboratory (OSUNRL)
The OSUNRL is a major asset of the OSU NE Program. The OSUNRL houses the OSURR a 500-kW pool type reactor, a Co-60 high-dose rate irradiation facility, and a sub-critical assembly. Director: Dr. Thomas E. Blue; Associate Director: Andrew Kauffman
Website: http://reactor.osu.edu/

The Ohio State University Research Reactor: The Ohio State University Research Reactor (OSURR) is a general-purpose research and testing reactor based on the Materials Testing Reactor (MTR) design.
Website: http://reactor.osu.edu/

Laboratories:

Ohio State's Academic Center of Excellence (ACE) in Instrumentation, Control and Safety
Structure: The Center is jointly operated by Ohio State University (OSU) and Idaho National Laboratories (INL). Its management structure is as follows:
OSU Director: C. Smidts
OSU Co-Director: T. Aldemir
Website: http://www.nuclear.osu.edu/ace

OREGON STATE UNIVERSITY

Department of Nuclear Engineering and Radiation Health Physics
116 Radiation Center
Corvallis, OR 97331-5902
(541) 737-2343
FAX: (541) 737-0480
Administrative Contact: Kathryn Higley
(541) 737-0675
kathryn.higley@oregonstate.edu
Website: http://ne.oregonstate.edu/

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	10	6	19	19	26
Masters	9	5	2	7	9
PhD	2	2	0	1	3

Graduate Student Enrollment: 27 Masters/13 Ph.D.
ABET Accreditation: BS Nuclear Engineering; BS Radiation Health Physics

Distance Education Program
Offers Nuclear Engineering Courses & Degrees Online
http://ne.oregonstate.edu/

Nuclear Science and Engineering Faculty

Kathryn A. Higley, Department Head and Professor (541-737-0675) [kathryn.higley@oregonstate.edu]
Ph.D., Colorado State University, 1994. Health physics; human and ecological risk assessment; environmental pathway analysis; environmental radiation monitoring; radionuclide and hazardous chemical transport; radiochemistry; neutron activation analysis; nuclear emergency response planning; environmental regulations. Website: ne.oregonstate.edu

Abdollah T. Farsoni, Assistant Professor (541-737-9645) [abi.farsoni@oregonstate.edu]
Ph.D., Oregon State University, 2006. Application of nuclear techniques in homeland security, development of new radiation detectors, designing advanced digital pulse processors for radiation detection and spectroscopy.

David M. Hamby, Professor, Graduate Program Chair (541-737-8682) [david.hamby@oregonstate.edu]
Ph.D., University of North Carolina, 1989. Health physics; beta dosimetry; beta spectroscopy; radiation instrumentation; environmental health physics; environmental transport; fate and transport model analysis; radiation risk; uncertainty analysis. Website: ne.oregonstate.edu

Jack F. Higginbotham, Professor (541-737-9949) [jack.higginbotham@oregonstate.edu] Ph.D., Kansas State University, 1987. Space Reactor Development, Nuclear Spectroscopy, Radiation Dosimetry, Radiation Shielding.

Andrew C. Klein, Professor (541-737-7061) [andrew.klein@oregonstate.edu] Ph.D., University of Wisconsin, Madison, 1983. Nuclear energy policy; space nuclear systems design; transient analysis of nuclear power systems; radiation shielding; nuclear nonproliferation; safeguards and security; and fusion energy systems design. Professional Engineer. Website: ne.oregonstate.edu

Wade Marcum, Assistant Professor (541-737-3018) [wade.marcum@oregonstate.edu] Ph.D., Oregon State University, 2010. Nuclear reactor thermal hydraulics; computational fluid dynamics; reactor safety; flow induced vibration; advanced reactor design. Website: http:\\ne.oregonstate.edu\

Todd S. Palmer, Professor (541-737-7064) [palmerts@ne.orst.edu] Ph.D., Nuclear Engineering and Scientific Computing**,** University of Michigan**,** 1993. Numerical techniques for particle transport and diffusion; computational fluid dynamics; reactor physics; general numerical methods; nuclear criticality safety; Monte Carlo methods; transport in stochastic mixtures.
Website:http://ne.oregonstate.edu/contact/index.html

Alena Paulenova, Assistant Professor (541-737-7070) [alena.paulenova@oregonstate.edu] Ph.D. Radiochemistry; Chemistry of Fuel Cycle; Advanced Separations Methods for the Used Fuel Reprocessing and Fuel Waste Forms; Behavior of Actinides and Fission Products; Environmental and Biomedical Applications. Website: http://ne.oregonstate.edu/contact/index.html

Brian G. Woods, Associate Professor (541-737-6335) [brian.woods@oregonstate.edu] Ph.D., University of Maryland, 2001. Experimental and computational fluid dynamics and heat transfer; nuclear reactor thermal-hydraulics; nuclear reactor safety.

Qiao Wu, Professor (541-737-7066) [qiao.wu@oregonstate.edu] Ph.D., Purdue University**,** 1995. Nuclear reactor thermal-hydraulics, two-phase flow theory and experiments, multiphase flow instrumentation, nuclear reactor safety, scaling analysis of complex systems, neutron radiography for two-phase flow visualization, nuclear system system design, fuel enrichment, system safety analysis code validation. Website: http:\\ne.oregonstate.edu\

Other Faculty

Steven R. Reese, Radiation Center Director **(**541-737-2341) **[**steve.reese@oregonstate.edu] Ph.D., Colorado State University**,** 1997. Regulatory Compliance; Reactor Dosimetry; Neutron Radiography; Neutron Depth Profiling; Prompt Gamma Neutron Activation Analysis.
Website: http://radiationcenter.oregonstate.edu/People/Reese.html

Jose N. Reyes, Jr. Professor-currently on leave (541-737-2343) [jose.reyes@oregonstate.edu] Ph.D.**,** University of Maryland**,** 1986. Thermal hydraulics; multi-phase fluid flow; scaling analyses; reactor safety; reactor system design. Professional Engineer.

Nuclear Science and Engineering Research Center

OSU Radiation Center: The department is housed in the **OSU Radiation Center**. Research facilities include a 1.1 MW TRIGA Mark II nuclear reactor; Advanced Thermal-Hydraulic Research Laboratory (ATHRL) which includes Advanced Plant Experiment (APEX) facility and the Multi-Application Light Water Reactor (MASLWR) facility; the Advanced Nuclear Systems Engineering Laboratory (ANSEL) which includes a High Temperature Test Facility (HTTF), a 1/4-scale test model of a modular High Temperature Gas-Cooled Reactor (HTGR), and a Fuel Development Hydro-Mechanical test loop; the Advanced Nuclear Instrumentation Development Laboratory; Radiochemical Analytical Laboratory with radio-HPLC- and radio-LC-IS-MS/MS systems; Cobalt-60 Gamma Irradiator; Neutron Radiography facilities; Gamma and Alpha Spectrometry facilities; Radiological Instrument Calibration facilities; Liquid Scintillation Counting Systems; Thermoluminescent Dosimetry Systems..

PENNSYLVANIA STATE UNIVERSITY

Mechanical and Nuclear Engineering
138 Reber Building
University Park, PA 16802
814-865-0036
FAX: 814-865-1280
Administrative Contact: Arthur T. Motta
814-865-0036
atm2@psu.edu
Website: www.mne.psu.edu

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	45	35	50	62	83
Masters	10 MS & 6 MEng	11 MS & 18 MEng	3 MS & 12 MEng	8 MS & 28 MEng	7 MS & 32 MEng
PhD	12	4	7	8	4

Graduate Student Enrollment: 16 MS & 83 MEng Masters/35 Ph.D.
ABET Accreditation: BS

Distance Education Program
Offers Nuclear Engineering Courses and Degree Online
http://www.engr.psu.edu/cde/nuce/index.html

Nuclear Science and Engineering Faculty

Arthur T. Motta, Chair and Professor **(**814-865-0036) [atm2@psu.edu] Ph.D., University of California-Berkeley**,** 1988. Irradiation effects in metals and microstructural evolution under irradiation both from an experimental and a theoretical point of view; behavior of materials, especially nuclear fuel cladding, in the nuclear reactor environment including corrosion, hydriding and irradiation effects.

Maria Avramova, Assistant Professor (814-865-0043) [mna109@psu.edu] Ph.D., Pennsylvania State University, 2007. Reactor thermal-hydraulics; core design; transient and safety analysis; multi-physics multi-scale simulations and uncertainty and sensitivity analysis.

Jack S. Brenizer, Jr., J. "Lee" Everett Professor of Mechanical and Nuclear Engineering **(**814-863-6384) [brenizer@engr.psu.edu] Ph.D.**,** Pennsylvania State University**,** 1981. Radiation detection, neutron radiography, neutron activation analysis, nuclear materials monitoring devices.

Gary L. Catchen, Professor **(**814-865-1339) [g9c@psu.edu] Ph.D.
Columbia University, 1979. Hyperfine interactions; radiation detection and measurement; radiation dosimetry; developing teaching techniques for nuclear science.

Fan-Bill Cheung, Professor of Mechanical and Nuclear Engineering **(**814-863-4261) [fxc4@psu.edu] Ph.D.**,** University of Notre Dame**,** 1974. Solidification and Melting; Turbulent Natural Convection; Two-Phase Flow and Heat Transfer; Nuclear Reactor Thermal Hydraulics and Safety; Thermal Processing of Materials; Thermal Behavior of High-Temperature Ablatives; Dense Spray and Atomization.

Massimiliano Fratoni, Assistant Professor of Nuclear Engineering (814-863-4391) [mfratoni@psu.edu] Ph.D., University of California, Berkeley, 2008. Advanced reactor design; core modeling and analysis; nuclear fuel cycle; nuclear waste repository modeling and analysis; system analysis.

Kostadin Ivanov, Distinguished Professor of Nuclear Engineering **(**814-865-0040**)** [kni1@psu.edu] Ph.D.**,** Bulgarian Academy of Sciences**.** Three-dimensional reactor core analysis; computational methods in reactor statics and dynamics; thermal-hydraulic reactor system transient modeling of power plants; coupled 3-D kinetics/thermal-hydraulic simulations and bench marking; core design and management. Professional Engineer.

Igor Jovanovic, Associate Professor (814-867-4329) [ijovanovic@psu.edu] Ph.D., University of California – Berkeley**,** 2001. Nuclear detection and nonproliferation; inertial confinement fusion; ultrafast and intense laser science and technology; remote sensing.

Seungjin Kim, Associate Professor of Mechanical and Nuclear Engineering **(**814-867-1783) [sxk86@psu.edu] Ph.D.**,** Purdue University**,** 1999. Thermal-hydraulics; Reactor Safety; modeling of two-phase flow and fluid particle interactions; interactions; interfacial area transport modeling; two-phase flow experiment and instrumentation; reactor system analysis code development and Very High Temperature Reactor.

Kenan Unlu, Director of Radiation Science and Engineering Center and Professor (814-865-6351) [kxu2@psu.edu] Ph.D., University of Michigan, 1989. Development and Applications of Nuclear Analytical Techniques; Neutron Depth Profiling; Cold Neutron Prompt Gamma Activation Analysis; Neutron Radiography, Neutron Activation Analysis; Radiation Detection; Radiochemistry; Nuclear Forensic and Nuclear Security Education.

Other Faculty

Brenden Heidrich, Research Associate / Senior Reactor Operator (814-863-2820) [heidrich@psu.edu] Ph.D., Pennsylvania State University (2012). Reactor physics and experimental design; operational characteristics of research reactors; economics of nuclear electricity generation; safety and reliability of complex engineering system; nuclear and radiological security. Engineer-in-Training.

Darryl Farber, Assistant Professor of Science, Technology, and Society and Affiliate Assistant Professor of International Affairs. (814-865-3042) [dfarber@engr.psu.edu] Ph.D., The Pennsylvania State University, 1999. Policy and management of nuclear waste; scenario analysis and planning for engineering systems; nuclear ethics.

Amanda Johnsen, Research Associate (814) 863-2653 [ajohnsen@psu.edu] Ph.D., University of California, Berkeley (2008). Production and purification of radioisotopes; neutron activation analysis; chemistry of used nuclear fuel and reprocessing; environmental radiochemistry; radiochemistry education.

Barry Scheetz, Professor of Civil and Nuclear Engineering **(**814-865-3539) [se6@psu.edu] Ph.D., Materials. Radioactive waste disposal, cementitious and ceramic waste forms, x-ray diffraction.

Justin Watson, Research Associate, Applied Research Laboratory The Pennsylvania State University (814-863-6754) [jkw104@psu.edu] Ph.D., Pennsylvania State University, 2010. Computational fluid mechanics; Nuclear reactor safety analysis; core design; System simulation; Advanced numerical methods for multi-physics simulations; Parallel computation for nuclear reactor safety analysis.

Nuclear Science and Engineering Research Centers

Advanced Multi-Phase Flow Laboratory (AMFL): To perform scaled experiments, model two-phase flow phenomena, develop instrumentation, improve the reactor system analysis, and to provide hands-on experience to both graduate and undergraduate students.

Intense Laser Laboratory (ILL): Established in 2010, ILL features a state-of-the-art terawatt laser system capable of producing relativistic focal spot intensities. Also available are extensive electronic and optical diagnostics systems and multiple vacuum experimental chambers. The mission is to develop methods to advance applied nuclear science by use of high-power lasers and optical techniques, with particular interest on laser-driven radiation sources and remote sensing. Prof. Igor Jovanovic.

Reactor Dynamics and Fuel Management Group: The Reactor Dynamics and Fuel Management Research Group (RDFMG), was established at Penn State University (PSU) in the Spring 2000, to address the current demands for more accurate and efficient reactor analyses, which directly relate to safety and economic performance of current and next generations nuclear systems. The research performed by RDFMG is in the related areas of reactor physics, nuclear safety and fuel management. The work in each of these areas involves development, coupling, qualification and application of reactor analysis tools and focuses on integration of advanced multidimensional reactor design and safety analysis physics methodologies. Special emphasis is put on development of methods and computer codes for core design and on coupled space-time kinetics/thermal-hydraulic system modeling. Director: Dr. Kostadin Ivanov, Distinguished Professor of Nuclear Engineering,

Radiation Science and Engineering Center: The Radiation Science and Engineering Center (RSEC) is a unit under the College of Engineering and the Vice President for Research at Penn State. The RSEC is affiliated with the Department of Mechanical and Nuclear Engineering. The RSEC facilities include the Penn State Breazeale Reactor (PSBR), gamma irradiation facilities (In-pool Irradiator, Dry Irradiator, and Hot Cells), and various radiation detection and measurement laboratories. The PSBR is a 1 MW, TRIGA with moveable core in a large pool and with pulsing capabilities.

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Distance Education Program
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Nuclear Science and Engineering Faculty

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Daniel Cole, Assistant Professor (412-624-3069) [dgcole@pitt.edu] Ph.D. , Virginia Polytechnic Institute and State University, 1998. Dynamic systems; measurement and control. Professional Engineer.

Mark Kimber, Assistant Professor (412-624-8111) [mlk53@pitt.edu] Ph.D**.,** Purdue University**,** 2008**.** Thermal Hydraulics; Electronics Cooling.

Jung-Kun Lee, Assistant Professor (412-648-3395) [jul37@pitt.edu] Ph.D.**,** Seoul National University**,** 2000**.** Nanotechnology; radiation effects on Material Properties; Ion-beam Synthesis of functional materials. Website: http://www.engr.pitt.edu/mems/people/facstaff/lee_jungkun.html

Jorg Wiezorek, Associate Professor (412-624-5430) [wiezorek@pitt.edu] Ph.D., University of Cambridge, Cambridge, UK**,** 1994**.** Materials Science & Engineering; Physical Metallurgy & Metal Physics; Phase Transformations; Micro-Characterization & Analysis by Diffraction and Spectroscopy; Transmission Electron Microscopy; Scanning Electron Microscopy; Mechanical Behavior; Microstructure Engineering.

Other Faculty

David Aumiller, Adjunct Associate Professor (724-516-9437) [dla12@pitt.edu] Ph.D., The Pennsylvania State University, 1996. Two-phase flow and heat transfer; best-estimate plus uncertainty methods development; reactor safety code development.

Ken Balkey, Adjunct Lecturer (412-374-4633) [balkeykr@westinghouse.com] M.S.**,** University of Pittsburgh**,** 1980**.** Nuclear codes and standards; risk assessment; mechanical component integrity; nuclear reactor pressure vessel integrity; piping design-by-analysis.

John Bartocci, Adjunct Lecturer (412-624-5430) [jtb51@pitt.edu] B.S.**,** Massachusetts Institute of Technology**.** SRO Certified Instructor.

Bruce Berquist, Adjunct Associate Professor (412-476-6053) [berqb@comcast.net] Ph.D., University of Pittsburgh**,** 1979**.** Nuclear materials development.

Michael Burke, Adjunct Professor (412-256-1788) [Burkema@Westinghouse.com] Ph.D., University of Sheffield, UK, 1981. Performance of Materials for Nuclear plants particularly aging materials degradation.

Lawrence Corr, Adjunct Assistant Professor (412-624-5430) [lrcorr@pitt.edu] Ph.D.

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Gary Elder, Faculty Lecturer (412-856-5967) [eldergg@westinghouse.com] Ph.D., University of Pittsburgh**,** 1982**.** Operating nuclear plants.

Vinny Esposito, Adjunct Professor (724-327-9593) [esposivj@westinghoue.com] D.Sc., University of Virginia, 1968. Nuclear core Thermal Hydraulics; Safety Analysis; Fuel Design; Numerical Analysis.

Larry Foulke, Adjunct Professor (412-653-0978) [lrf4@pitt.edu] Ph.D.**,** Massachusetts Institute of Technology**,** 1967**.** Nuclear core and plant dynamics; public policy; space-time kinetics; space nuclear power. Professional Engineer.

Daniel Gill, Adjunct Lecturer (412-476-7714) [dfg3@pitt.edu] Ph.D., The Pennsylvania State University**,** 2009. **N**umerical particle transport theory; computational physics; numerical analysis.

David Griesheimer, Adjunct Assistant Professor (412-624-5430) [dpg20@pitt.edu] Ph.D., University of Michigan, 2004. Computational methods of radiation transport; Monte Carlo methods; multiphysics methods for reactor analysis; high performance and parallel computing.

Jason Gruber, Adjunct Assistant Professor (412-624-5430) [jas182@pitt.edu] Ph.D., Carnegie Mellon University, 2007. Computational materials science, multiscale materials modeling, microstructural science, texture and anisotropy, numerical methods and global optimization.

David Haser, Faculty Lecturer (412-367-9177) [haserd@firstenergy.com] MBA**,** Youngstown State University**,** 2005**.** SRO License; Safety Culture; Plant Operation Improvements; Nuclear Plant Operations and Safety. Professional Engineer.

David Helling, Faculty Lecturer (724-722-5301) [davidh179@gmail.com] B.S., Miami University, 1969. SRO License; Nuclear Power Plant safety and operations; Nuclear Power Plant instrumentation and control; Curriculum integration and online learning.

Melissa Hunter, Adjunct Assistant Professor (412-624-5430) [mah180@pitt.edu] Ph.D.

Jeffrey Lane, Adjunct Assistant Professor (412-624-5430) [jwl133@pitt.edu] Ph.D., University of Pennsylvania, 2009. Two-phase flow, computational analysis tools, analytical model development, and Best-Estimate Plus Uncertainty (BEPU) methodologies.

Andrea Maioli, Guest Lecturer (412-374-3572) [maiolia@westinghouse.com] Ph.D., Politecnico di Milano, 2007. Probabilistic Risk Assessment and Risk-informed Application for Nuclear power plants.

Justin Pounders, Adjunct Assistant Professor (412-624-5430) [jmp174@pitt.edu] Ph.D., Georgia Tech University. Computational methods development for reactor physics problems; neutronic homogenization and equivalence methods in plant simulations; transient multiphysics code coupling; tightly-coupled multiphysics computations.

Donald Scheef, Faculty Lecturer (724-722-5318) [scheefdm@westinghouse.com] M.S.**,** Purdue University**,** 1972.

Richard Siergiej, Adjunct Associate Professor (412-476-7587**) [**rrs27@pitt.edu] Ph.D., Lehigh University, 1992. Advanced instrumentation and control; wireless data transmission; solid-state physics; radiation effects on semiconductor devices.

Rachel Slaybaugh, Faculty Lecturer (412-624-5430) [rns37@pitt.edu] Ph.D., University of Wisconsin, 2011. Acceleration methods for massively parallel deterministic neutron transport codes; hybrid (deterministic-monte carlo) methods for shielding applications.

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B.S.	31	31	37	34	36
Masters	8	6	8	4	8
PhD	3	5	3	4	4

Graduate Student Enrollment: 18 Masters/35 Ph.D.
ABET Accreditation: B.S. (N.E.)

Nuclear Science and Engineering Faculty

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Jean Paul Allain, Associate Professor (765-496-9718) [allain@purdue.edu] Ph.D.**,** University of Illinois Urbana-Champaign**,** 2001**.** Surface and interface science; In-situ surface characterization techniques; Plasma-surface interactions; Radiation Interactions with soft matter; Magnetic nuclear fusion boundary physics; Inorganic surface-biomatter interface response to radiation; Laser-based post-ionization techniques; Soft X-ray sources for detection; Compact plasma-based neutron and photon sources; Nanolithography; Ultra-thin oxide films for advanced semiconductors; Advanced materials for radiation detection.

Chan Choi, Professor (765-494-6789) [choi@purdue.edu] Ph.D.**,** Southern Illinois University**,** 1973**.** Fusion Plasma Engineering; Compact Tori Plasma Studies; Inertial Confinement Beam Target Stability; Space Propulsion; Energy Conversion; Nuclear Nonproliferation.

Anter El-Azab, Professor (765-496-6864) [aelazab@purdue.edu] Ph.D.,University of California, Los Angeles, 1994. Structure, Thermodynamics and Kinetics of Materials; Mesoscale Mechanics; Radiation Effects in Nuclear.

Audeen Fentiman, Associate Dean of Graduate Education and Interdisciplinary Programs and Professor (765-494-1870) [fentiman@purdue.edu] Ph.D.**,** The Ohio State University**,** 1982**.** Radioactive Waste Management; Nuclear Fuel Cycle; Environmental Risk Assessment; Engineering Education.

Allen Garner, Assistant Professor (765-494-0618) [algarner@purdue.edu] Ph.D. University of Michigan - Ann Arbor, 2006. Biomedical applications of pulsed power and plasmas; Plasma Physics; Pulsed Power; High Power Microwaves; Theoretical biophysics.

Takashi Hibiki, Professor (765-496-9033) [hibiki@purdue.edu] Ph.D, Osaka University, 1990. Basic two-phase flow experiments and modeling; Interfacial area transport equation development; Development of fast neutron radiography systems; Thermal-hydraulic research at micro-gravity conditions; Flow-induced vibration analysis; Research reactor utilization for industrial purposes.

Mamoru Ishii, Walter H. Zinn Distinguished Professor (765-494-4587) [ishii@purdue.edu]**,** Ph.D.**,** Georgia Institute of Technology**,** 1971. Two-phase flow experiments and modeling research; 3-D two - fluid model and interfacial area transport.

Martin Lopez-De-Bertodano, Associate Professor (765-494-9169) [bertodan@purdue.edu] Ph.D.**,** Rensselaer Polytechnic Institute**,** 1992. Experimental Two-Phase Flow; Computational Fluid Dynamics; Turbulence; Thermal Hydraulics and Reactor Safety; Nuclear Systems Simulation.

Shripad T Revankar, Professor (765-496-1782) [shripad@purdue.edu] Ph.D., Karnatak University, 1983. Two-Phase Flow and Heat Transfer; Reactor Safety and Thermal Hydraulics; Next Generation Reactors; High Conductivity Nuclear Fuel; Multiphase Flow in Packed Beds (Trickle Bed Reactors); Multiphase Instrumentation Development; Fuel Cell -Design and Simulation; Regenerative Fuel Cell; Distributed Energy Generation; Hydrogen Generation -High Temperature Thermochemical Reactions; Hydrogen Storage. Website: http://cobweb.ecn.purdue.edu/~shripad/

Rusi Taleyarkhan, Professor of Nuclear Engineering **(**765-494-0198) [rusi@purdue.edu] Ph.D.(1982); M.B.A(1980), Rensselaer Polytechnic Institute**.** Nuclear power engineering, safety, thermal-hydraulics; homeland security; combating nuclear terrorism via novel sensor development; Nano-to-macro scale applications of nuclear technology; acoustic inertial confinement fusion; radiation-matter interactions coupled with thermal hydraulics; metastable fluid technologies for nanoscale energetic burst generation; advanced nuclear particle detection technologies based on metastable fluid states; novel explosives and propellant systems for less-than-lethal and barrier penetration devices. Website: https://engineering.purdue.edu/NE

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Other Faculty

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Sivanandan Harilal, Research Associate Professor (765-496-2233) [hari@purdue.edu] Ph.D., Cochin University of Science & Technology, India, 1998. Plasma diagnostics; Laser micro-machining; Nondestructive nuclear material sensors; Laser induced breakdown spectroscopy (LIBS); Plasma-facing components; Laser-produced plasma sources for lithography and microscopy; Colliding plasma; Discharged produced plasmas; High energy density physics; Surface Characterization techniques.

Gennady Miloshevsky, Research Assistant Professor (765-494-8618) [gennady@purdue.edu] Ph. D.**,** Academic Scientific Complex "A.V. Luikov Heat and Mass Transfer Institute" of the National Academy of Sciences of Belarus**,** 1998. Atomic and plasma physics; Interaction of radiation with matter; Space radiation transfer; Nuclear physics; Computational physics; Computational fluid dynamics; Multiphase flows; Medical radiation physics; Ion and water permeation in proteins; Gating of protein channels and transporters; Protein aggregation in lipid bilayer. Website: https://engineering.purdue.edu/NE

Valeryi Sizyuk, Research Assistant Professor (765-494-4217) [vsizyuk@purdue.edu] Ph.D., Belarus State University, Minsk Belarus, 1997. Reactor Fusion; Plasma. Prof. V. Sizyuk has extensive background in computational physics, plasma physics and hydrodynamics, computing technologies and their application in high volume manufacture. Website: https://engineering.purdue.edu/NE

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B.S.	49	30	24	41	32
Masters	2	3	0	2	2
PhD	0	2	6	1	4

Graduate Student Enrollment: 6 Masters/26 Ph.D.
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Nuclear Science and Engineering Faculty

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Other Faculty

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Mark J. Embrechts, Associate Professor (518-276-4009**) [**embrem@rpi.edu] Ph.D.**,** Virginia Polytechnic Institute**,** 1981**.** Application of neutral networks and fuzzy logic for manufacturing and process control; image recognition and classification with the aid of neural networks; neural networks, fractals, chaos, and wavelets for time-series analysis; data mining and computational intelligence.

Thomas C. Haley, Clinical Associate Professor; Director of Student Services (518-276-2255) [haleyt2@rpi.edu] Ph.D.**,** Rensselaer Polytechnic Institute**,** 2000**.** Teaching award-winning blended/hybrid university courses.

Richard T Lahey, Jr., Professor Emeritus (518-276-6351) [laheyr@rpi.edu**]** Ph.D.**,** Stanford University**,** 1971. Multiphase flow and boiling heat transfer; Nuclear reactor thermal-hydraulics and safety analysis; Sonofusion technology.

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Ph.D., Massachusetts Institute of Technology, 1967. Fusion systems analysis; plasma engineering; blanket design and overall fusion reactor design.

Timothy H Trumbull, Adjunct Assistant Professor; Director of Reactor Critical Facility (518-276-6351) [trumbt2@rpi.edu] Ph.D., Rensselaer Polytechnic Institute, 2004. Nuclear engineering education; critical facility operations and experimentation.

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Nuclear Science and Engineering Research Centers

The **Gaerttner Linear Accelerator (LINAC) Center** has been engaged in active research continuously for over 45 years, and is centered around a multi-million dollar, high power, >60 MeV, L-band traveling wave, electron linear accelerator. The primary research thrust of the center is obtaining nuclear data for use in a variety of applications, ranging from the design of nuclear reactors and analysis of criticality to radiation damage and new nuclear medicine technologies. A newly constructed facility adds new research capabilities in the area of nuclear criticality safety, with a new detection system designed to measure the probability of neutron capture in different materials.

The **Walthousen Critical Reactor Facility** is a low watt, fully functioning reactor for operational training and core physics studies and is available for student use in conjunction with modern nuclear radiation detection and characterization systems.

The **Center for Multiphase Research (CMR)** brings together faculty from the Schools of Engineering and Science. There are opportunities for both graduate and undergraduate students to participate in research at the CMR. Current areas of research include: Designing and performing two-phase flow experiments, including fundamentals of two-phase flow physics and system-type experiments. Examples include: two-phase flow turbulence, interfacial forces, bubble size distribution, phase separation, boiling heat, pressure drop in two-phase channels and loops, phase distribution in various channel geometries, gas distribution and heat transfer form ablating surfaces exposed to spreading liquid flows, multi- channel effects, flooding, two-phase flow transients and oscillations. Development of physically-based constitutive models of two-phase flow, and of component models of two-phase flow systems. Examples: mechanistic models of interfacial forces, a mechanistic model of void distribution in subcooled boiling, a widely used model of wall heat flux partitioning in subcooled boiling, a mechanistic model of critical heat flux (CHF). Application of Computational Multiphase Fluid Dynamics (CMFD) and other computational methods to simulate two-phase flow systems, including steady-state operation, transients/instabilities and 3-dimensional effects. Development of graphical tools, such as graphical user interface (GUI) for computer simulations.

The **Multiscale Science & Engineering Center (MSEC)** was established in October 2006 to create a collaborative environment of faculty to develop and transition Multiscale technologies to industry and government. Rensselaer is among the first universities to recognize that a systematic multiscale theory combined with intensive technology transfer effort would propel the Institute's initiatives in numerous fields. One MSEC project is the VIP-Man Virtual Patient, with which researchers study multiscale human computing applications on radiation modeling in geometry modeling, radiation transport, treatment optimization, and X-ray CT imaging.

The **Center for Engineering-Based Patient Modeling (CEPM)** brings together engineers, biomedical scientists and clinicians who conceive and carry out synergistic projects that solve important clinical problems using physics-based and design-driven computational and experimental methods.

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B.S.	0	0	0	0	0
Masters	3	6	10	12	14
PhD	1	0	0	1	0

Graduate Student Enrollment: 46 Masters/14 Ph.D.

Distance Education Program
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Nuclear Science and Engineering Faculty

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Dan G. Cacuci, Endowed Chair Professor and Director, SmartState Center of Economic Excellence in Nuclear Science and Energy (803-777-5316) [cacuci@cec.sc.edu] Ph.D.,Columbia University in New York, 1978. Predictive science, sensitivity and uncertainty quantification, model validation, reactor physics and safety.

Fanglin (Frank) Chen, Assistant Professor (803-777-4875) [chenfa@cec.sc.edu] Ph.D., Georgia Institute of Technology, 2001. Ceramic materials; Dense membrane for hydrogen seperation; Metal hydride for hydrogen storage; Tritium separation Website: http://www.me.sc.edu/fs/chen.html

Xinyu Huang, Assistant Professor (803-777-6834) [huangxin@cec.sc.edu] PhD., Virginia Tech, 2001. Composite materials. Website: http://www.me.sc.edu/fs/xhuang.html.

Djamel Kaoumi, Assistant Professor (803-777-0926) [kaoumi@cec.sc.edu] Ph.D., Penn State, 2007. Nuclear Materials, Structural materials, cladding, Radiation effects, in-situ TEM, Materials Characterization, SEM, XRD, ion irradiation, Mechanical testing.

Jamil Khan, Professor and Chair (803-777-1578) [khan@cec.sc.edu] Ph.D., Clemson, 1988. Heat transfer; fluid dynamics. Website: http://www.me.sc.edu/fs/khan.html

Jeffrey H. Morehouse, Associate Professor (803-777-3017) [more@cec.sc.edu] Ph.D., Auburn University, 1976. Renewable Energy. Professional Engineer.

Michael Sutton, Professor (803-777-7158) [sutton@sc.edu] Ph.D., University of Illinois, Champaign-Urbana, 1981. Fracture; fatigue; vision-based measurements; experimental solid mechanics; biomechanics; composite and metallic material characterization.

Other Faculty

Joshua Gray, Research Faculty (803-725-8272) [joshua.gray@srnl.doe.gov] Ph.D., University of Illinois at Urbana-Champaign, 2004. Nuclear Fuel Cycle, Renewable and Sustainable Energy.

Luther L Hamm, Adjunct Professor (803-725-2520) [luther.hamm@srnl.gov] Ph.D., USC, 1982. Subsurface contaminant transport within the environment.

Valmore (Val) J. Loiselle, Adjunct Professor **(**803-736-5588) [loiselle@cec.sc.edu] MSME w/ Minor NE, RPI, 1973. Retired.

W. Cyrus Proctor, Research Faculty (803-777-8646) [proctowc@mailbox.sc.edu] Ph.D., North Carolina State University, 2012. Best-Estimate Predictive Science; Neutronics.

Elwyn Roberts, Visiting Professor (803-777-2252) [robertse@cec.sc.edu] Ph.D., University of Sheffield, 1960. Materials performance in nuclear reactors; product design; manufacturing and concurrent engineering. Website: http://www.me.sc.edu/fs/roberts.html

William A Summers, Adjunct Professor, USC; Manager, Nuclear Energy Programs, Savannah River National Laboratory (803-725-7766) [william.summers@srnl.doe.gov] Ph.D., University of Pittsburgh 1985. Nuclear energy systems; advanced reactors; nuclear hydrogen production.

James Tulenko, Adjunct Professor. (352-219-3865) [tulenko@gmail.com] Masters in Nuclear Engineering, MIT. Nuclear Fuel Performance.

Lingyu Yu, Assistant Professor (803-777-4902) [yu3@cec.sc.edu] Ph.D., University of South Carolina, 2006. Structural Health Monitoring and Diagnosis.

Nuclear Science and Engineering Research Centers

USC Nuclear Materials Laboratory: The USC Nuclear Materials Laboratory is equipped and licensed for working with uranium ad thorium based fuels as well as non-radioactive materials routinely studied including high temperature alloys and ODS steels. The key facilities of this laboratory include high temperature furnaces for processing and testing of high temperature ceramics and metals, high vacuum systems, inert atmosphere glovebox, radiological hood, a customized fluidized-bed chemical vapor deposition coater for studies of coated particle fuels, a very high-temperature mechanical testing machine including a creep/tensile test stand, TEM sample holder for in-situ straining experiments, differential scanning calorimeter, thermogravimetric analyzer and equipment for characterization such as density, particle size, surface area, and porosity measurement and a full suite of metallographic sample preparation (grinder/polisher, electropolisher).

Thermal Hydraulics Laboratory: Thermal hydraulic test loops and laboratories are dedicated to studies of enhanced heat transfer, fluid flow, pressure drop and other phenomena associated with nuclear fuel rods and assemblies.

High Performance Computing: High performance computing facilities are used to analyze and model nuclear reactors, advanced fuel cycles, and advanced nuclear fuels and materials. Modeling and simulation codes and tools are employed for neutronic, thermal hydraulic, computational fluid dynamics (CFD), thermochemical, safety and risk, shielding, and finite element analyses. Sample code packages include MCNP5, SCALE6.0, ERANOS2.1, FACT-SAGE6.1, ABAQUS, Comsol Multiphysics, etc.

Nuclear Science and Energy Center of Economic Excellence

General Atomics Center for the Development of Transformational Nuclear Technologies

SOUTH CAROLINA STATE UNIVERSITY

Civil & Mechanical Engineering Technology and Nuclear Engineering
300 College Street; NE
Orangeburg, South Carolina 29117
803-516-4758
FAX: 803-516-4526
Administrative Contact: Kenneth Okafor
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kokafor@scsu.edu

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	2	1	6	10	8

ABET Accreditation: Nuclear Engineering

Nuclear Science and Engineering Faculty

Zheng Chang, Associate Professor (803-536-7924) [zchang99@gmail.com] Ph.D., Tokyo Institute of Technology, 1993. Radiochemistry; Nuclear Engineering; Environmental Radioactivity; Nuclear Detection Technology.

Musa B Danjaji, Associate Professor **(**803-516-4591) [mbdanjaji@scsu.edu] Ph.D**.,** University of Illinois at Urbana-Champaign**,** 1993. Radiation effects in materials; Radiation Protection; Nuclear Batteries; Research in alternative energy (Biodiesel, Hydrogen Production; Solar; Wind Turbine; Hydrogen Storage; Fuel Cells)

Kenneth C Okafor, Associate Professor **(**803-516-4758) [kokafor@scsu.edu] Ph.D., The Ohio State University, 1988. Alternative Energy Studies.

Other Faculty

Kara N. Beharry, Instructor **(**803-516-4923) [kbeharry@scsu.edu] M.S.**,** University of Florida – Gainesville**,** 2009**.** Radiation Protection.

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Administrative Contact: Lydia Salmon-Wright
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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	28	36	36	30	42
Masters	13	15	11	17	22
PhD	2	4	5	6	10

Graduate Student Enrollment: 66 Masters/47 Ph.D.
ABET Accreditation: B.S. (N.E.)

Distance Education Program
Offers Nuclear Engineering Courses and Degree Online
http://www.engr.utk.edu/nuclear/

Nuclear Science and Engineering Faculty

J. Wesley Hines, Professor and Department Head (865-974-6561) [jhines2@utk.edu] Ph.D., Ohio State. Research interests: diagnostics and surveillance, artificial intelligence methods, expert systems and neural networks.
Website: http://www.engr.utk.edu/nuclear/Projects/JWH-Grants10-09.pdf

Bethany L. Goldblum , Assistant Professor (865-974-5057) [goldblum@utk.edu] Ph.D., University of California. Research Interests: cross section measurements, nuclear forensics, homeland security.

Howard L. Hall, Governor's Chair Professor (865-974-2525) [hhall6@utk.edu] Ph.D., University of California, Berkeley. Research Interests: nuclear security applications, including proliferation detection, counterproliferation, detection of and response to radiological/nuclear threats, nuclear forensics, radiochemistry, and applications of nuclear-based methods to other security needs (such as explosives detection).
Website: http://hall-research.engr.utk.edu/Welcome_to_Professor_Halls_Research_Group.html

Jason P. Hayward , Assistant Professor (865-974-2536) [jhayward@utk.edu] Ph.D.
Research interests: Radiation detection and measurement, nuclear security and safeguards, nuclear instrumentation, medical and health physics.

Website: http://www.engr.utk.edu/nuclear/Projects/JPHGrantsContracts-12-09.pdf

Lawrence H. Heilbronn, Assistant Professor (865-974-2525) [lheilbro@utk.edu] Ph.D., Michigan State. Research interests: high-energy neutron production from heavy-ion interactions.

Haitao Liao, Assistant Professor [hliao4@utk.edu] Ph.D.**,** Ruthers University. Research interests: accelerated life testing, probabilistic risk assessment, condition based maintenance, maintenance planning and scheduling, spare parts logistics.

G. Ivan Maldonado, Associate Professor (865-974-7562) Ph.D.**,** North Carolina State University. Research interests: incore fuel management, fuel cycle analysis, advanced reactors.

Laurence F. Miller, Professor **(**865-974-5048) [lfmiller@utk.edu] Ph.D., Texas A&M. Research interests: particle and radiation transport, diagnostics and surveillance, waste management, health physics, modeling and simulation, instrumentation and control. Professional Engineer.

Ronald E. Pevey, Associate Professor (865-974-7573) **[**rpevey@utk.edu] Ph.D., University of Tennessee. Research interests: reactor physics, thermal hydraulics, computer methods development, shielding, nuclear criticality safety. Professional Engineer.

Arthur E Ruggles, Professor **(**865-974-2525) [aruggles@utk.edu] Ph.D., RPI. Research interests: reactor thermalhydraulics, liquid metal flow and heat transfer, cavitation and fluid transients, accelerator target design and microchannel flow.

Lawrence W. Townsend, Professor (865-974-7569) [ltownsen@utk.edu] Ph.D., Idaho. Research interests: radiation physics, transport, shielding and risk assessment; Nuclear and Radiological engineering; Theoretical nuclear physics.

Belle R. Upadhyaya, Professor (865-974-7576) [bupadhya@utk.edu] Ph.D., University of California, San Diego. Research interests: dynamics, instrumentation and control, monitoring and diagnostics, advanced signal processing, next generation reactors, autonomous control of space reactors, nondestructive examination, reliability and maintainability engineering. Professional Engineer. Website: http://web.utk.edu/~bru/

Brian D. Wirth, Governor's Chair Professor **(**865-974-2552) [bdwirth@utk.edu] Ph.D., University of California. Research Interests: computational modeling and measurements of radiation effects in materials, molecular dynamics simulation, nano-materials.

Other Faculty

Ted Besmann, Adjunct Professor (865-574-6852) [besmanntm@ornl.gov] Ph.D., Pennsylvania State University, 1976. Materials research for advanced nuclear fuels, nuclear waste glass, fuel cell materials, high-temperature composites, nano-grain coatings, thermodynamics, and wear behavior

Ray S. Booth , Research Professor (865-974-2525) [rbooth@utk.edu] Ph.D., Florida. Research interests: liquid metal reactors, research reactors, environmental impacts, neutron wave propagation.

David Cook, Adjunct Associate Professor (865-574-5690) [cookdh@ornl.gov] Ph.D., University of Tennessee, 1984. Reactor safety analysis, research reactor operations and safety, two-phase flow, isotope separations, and radiological source term modeling.

H. L. Dodds, IBM Professor **(**865-974-2525) [utne@utk.edu] Ph.D., UT. Research interests: reactor core analysis, transient modeling and simulation, reactor safety analysis, advanced reactors, nuclear criticality safety, energy policy. Professional Engineer.
Website: http://web.utk.edu/~hdj/

Mario Fontana , Research Professor **(**865-974-2525) [mfontana@utk.edu] Ph.D., Purdue. Research interests: power reactor safety (including response to potential terrorist attack, and advanced reactor systems. Professional Engineer.

Barry D. Ganapol, Research Professor (865-974-2525) [bganapol@utk.edu] Ph.D., University of California, Berkeley. Research interests: Deterministic and analytical transport theory.

Jess Gehin, Adjunct Associate Professor (865-576-5093) [gehinjc@ornl.gov] Ph.D., Massachusetts Institute of Technology, 1992. Nuclear system design and analysis, reactor transient analysis, advanced simulation of light water reactors, and fuel cycle analysis.

Andrei Gribok , Research Assistant Professor **(**865-974-2525) [agribok@utk.edu] Ph.D., Moscow Inst of Biological Physics. Research interests: artificial intelligence techniques, surveillance and diagnosis, Inverse and ill-posed problems, Regularization theory.

Martin L. Grossbeck, Research Professor **(**865-974-2525) [mgrossbe@utk.edu] Ph.D., Illinois. Research interests: radiation effects in materials, burnable absorbers, research reactors, and ultra-high vacuum technology.

Robert Grove, Adjunct Associate Professor (865-574-4646) [grovere@ornl.gov] Ph.D., University of Michigan, 1996. Radiation transport methods development and applications, reactor physics, shielding, heavy water reactors, and naval reactors

Vincent Jodoin, Adjunct Associate Professor (865-574-0420) [jodoinvj@ornl.gov] Ph.D., Air Force Institute of Technology, 1994. Nuclear security, nuclear fallout modeling, radiological source term modeling, and nuclear forensics.

Jack Miller, Research Professor **(**865-974-2525) Ph.D., University of California. Research interests: space radiation protection and radiological engineering.

Hanna Moussa, Research Assistant Professor (865-974-2525) [hmoussa@utk.edu] Ph.D., Tennessee. Research Interests: radiation safety, Monte Carlo simulation of radiation transport.

Fred R. Mynatt, Research Professor **(**865-974-2525) [fmynatt@utk.edu] Ph.D., Tennessee. Research interests: radiation transport, isotope production and nuclear regulations.

Andrew Stephan, Research Assistant Professor **(**865-974-2525) Ph.D., Tennessee. Research interests: radiation detection and homeland security.

Timothy Valentine, Research Associate Professor **(**865-974-2525) [tvalenti@utk.edu] Ph.D., Tennessee. Research interests: nuclear system safety and energy policy.

Nuclear Science and Engineering Research Centers /Collaborating Centers of Excellence

Reliability and Maintainability Center

Scintillation Materials Research Center

Thompson Cancer Survival Center

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	26	32	38	44	58
Masters	20	13	26	19	26
PhD	11	8	11	5	7

Graduate Student Enrollment: 86Masters/54 Ph.D.
ABET Accreditation: Nuclear Engineering, Radiological Health Engineering

Nuclear Science and Engineering Faculty

Yassin A. Hassan, Professor and Department Head (979-845-7090) **[**y-hassan@tamu.edu] Ph.D**.,** University of Illinois**,** 1979**.** Nuclear Power Engineering: Thermal Hydraulics. Professional Engineer.

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William S. Charlton, Associate Professor; Director, Nuclear Security Science and Policy Institute (979-845-7092) [wcharlton@tamu.edu] Ph.D., Texas A&M University, 1999. Nuclear Security and Nonproliferation; Nuclear Power Engineering: Reactor Analysis and Design.
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Other Faculty

Leslie A. Braby, Senior Lecturer; Research Professor (979-862-1798) [labraby@tamu.edu] Ph.D., Oregon State University**,** 1972. Health Physics; Radiation Biology; Medical Physics.

Sunil S. Chirayath, Visiting Assistant Professor (979-862-2616) [sunil@ne.tamu.edu] Ph.D., University of Madras, India, 2005. Nuclear Security and Nonproliferation.

Ron Hart, Professor Emeritus (979-845-4157) **[**rhart@tamu.edu] Ph.D**.,** University of California, Berkeley**,** 1967. Nuclear Materials and Fuel Cycles. Professional Engineer.

Cable Kurwitz, Lecturer (979-845-6126) [kurwitz@tamu.edu] Ph.D**.,** Texas A&M University**,** 2009. Nuclear Power Engineering: Space Power; Thermal Hydraulics**.** Professional Engineer.

Craig Marianno Visiting Assistant Professor; TEES Research Engineer, NSSPI (979-845 -6093) [mairanno@tamu.edu] Ph.D., Oregon State University**,** 2000. Nuclear Security and Nonproliferation.

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Paul Nelson, Professor Emeritus; Associate Director for International Programs, NSSPI (979-845-4132) [pnelson@ne.tamu.edu] Ph.D. , University of New Mexico, 1969. Nuclear Security and Nonproliferation.

Natela Ostrovskaya, Senior Lecturer (979-862-4409) [natela@ne.tamu.edu] Ph.D., Texas A&M University**,** 2005**.** Health Physics; Radiation Biology; Medical Physics.

Alexander Solodov, Lecturer (979-862-2628) [solodovaa@ornl.gov] Ph.D., Texas A&M University, 2007, Nuclear Security and Nonproliferation.

Galina Tsvetkova, Lecturer (979-845-4162) [tsvetkovag@tamu.edu] Ph.D., Texas A&M University**,** 2003. Health Physics; Radiation Biology; Medical Physics.

Nuclear Science and Engineering Research Centers

Center for Large-scale Scientific Simulations (CLASS): Dr. Jim Morel, Director. CLASS' objectives are to advance the state of the art in large-scale scientific simulations, and to lead the development of educational programs whose participants will be exceptionally well qualified for careers in scientific simulation. http://class.tamu.edu

Institute for National Security Education & Research (INSER): Dr. Marvin Adams, Director. INSER develops and implements graduate-level education programs targeted at national security professionals as well as organizes and implements multidisciplinary research and development programs that are relevant to national security. http://inser.tamu.edu

Nuclear Security Science and Policy Institute (NSSPI): Dr. William Charlton, Director. The mission of NSSPI is to work collaboratively with national laboratories and other partners to develop and apply science and technology to detect, prevent, and reverse the proliferation of nuclear and radiological weapons and guard against nuclear terrorism; educate the next generation of leaders in the field of nuclear security sciences; and to study the policy implications of deploying new technologies. http://nsspi.tamu.edu.

Nuclear Science Center (NSC): Dr. Warren Reece, Director. This facility has a one-megawatt TRIGA swimming pool reactor that can be pulsed and a variety of other features including experimental laboratories, a large irradiation cell, beam ports, a thermal column and a pneumatic "rabbit" system. One of the best-equipped facilities of its type in the country, the facility is used in our laboratory courses as well as our research program. http://nsc.tamu.edu

Nuclear Power Institute (NPI): Dr. K. Lee Peddicord, Director. NPI brings together four-year universities, two-year technical and community colleges, and public schools with the nuclear power industry, state and local organizations, and state, federal, and international agencies to assist with meeting the challenge of providing the trained workforce needed to operate new and existing reactors in Texas. http://www.nuclearpowerinstitute.org

Facilities:
AGN-201M Teaching Reactor
Fuel Cycle & Materials Facility
Ions & Materials Accelerator Facility
Laser Diagnostics Multiphase Flow Laboratory
Micro-Beam Cell Irradiation Facility
Nuclear Heat Transfer Systems Laboratory
Radiation Detection Measurement Laboratory

UNIVERSITY OF TEXAS at AUSTIN

Mechanical Engineering
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Austin, Texas 78712-0292
512-232-5371
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djudson@mail.utexas.edu
Website: www.nuclear.engr.utexas.edu

	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	n/a	n/a	n/a	n/a	n/a
Masters	6	7	7	6	4
PhD	10	3	1	3	3

Graduate Student Enrollment: 18 Masters/22 Ph.D.
ABET Accreditation: BS in Mechanical Engineering

Distance Education Program
Offers Nuclear Engineering Courses and Degree Online
http://www.me.utexas.edu/~nuclear/index.php/current-students/course-offerings

Nuclear Science and Engineering Faculty

Stephen R.F. Biegalski, Assistant Professor and Director Nuclear Engineering Teaching Lab (512-232-5380) [biegalski@mail.utexas.edu] Ph.D., University of Illinois, 1996. Nuclear analytical methods; nuclear instrumentation; nuclear reactor design; neutron radiography; analysis of environmental media with nuclear methods; modeling of environmental pathways; reactor operations and reactor safety analysis. Professional Engineer.
Website: http://www.me.utexas.edu/~nuclear/index.php/faculty-and-staff/89-steve-biegalski

Mark Deinert, Assistant Professor (512-471-7916) [mdeinert@mail.utexas.edu] Ph.D., Cornell University, 2003. Applied nuclear physics, actinide transmution in light-water reactors, advanced nuclear fuel cycles, transport theory, energy economics, thermal fluid transport in porous media within repository environments reaction diffusion processes. Website:
http://www.me.utexas.edu/~nuclear/~deinert

Dale Klein, Professor, Associate Director, Energy Institute, and Associate Vice President of Research (512-499-4709) [dale.klein@ mail.utexas.edu] Ph. D., University of Missouri-Columbia**,** 1977**.** Radioactive waste disposal; thermal analysis of nuclear shipping containers; nuclear weapon dismantlement; thermal-hydraulics
Website: http://www.me.utexas.edu/~nuclear/index.php/faculty-and-staff/93-dale-klein

Sheldon Landsberger, Professor (512-232-2467) [s.landsberger@mail.utexas.edu] Ph.D., University of Toronto, 1982. Radioactive and solid waste management; neutron activation analysis; Compton suppression low-level counting; air pollution; long distance air transport of heavy metals; radiation exposure; materials damage.
Website: http://www.me.utexas.edu/~nuclear/~landsberger

Erich Schneider, Assistant Professor (512-232-5412) [eschneider@mail.utexas.edu]
Ph.D., Cornell University, 2002. Computational modeling and simulation of nuclear system; nuclear systems engineering; research of nuclear reactor technologies; nuclear fuel; the sustainability of nuclear power; modeling the transport of neutrons and other subatomic particles to study the performance of nuclear fuel in very intense radiation fields such the next generation of nuclear reactors.; particle physics transport modeling in a NASA-sponsored project to study the interactions of heavy ions from solar radiation with microelectronic satellite components; anti-proliferation measures in the civilian nuclear power industry; modeling the effectiveness of proliferation countermeasures in gas centrifuge enrichment facilities.
Website: http://www.me.utexas.edu/~nuclear/index.php/faculty-and-staff/90-erich-schneider

Other Faculty

Ofodike A. Ezekoye , Professor (512-471-3085) [dezekoye@mail.utexas.edu] Ph.D., Univ. of California, Berkeley, 1991. Fire modeling; engine modeling; fundamental flame processes; combustion; heat transfer; aerosols. Website: http://www.me.utexas.edu/~nuclear/index.php/faculty-and-staff/91-dk

Kendra M Foltz-Biegalski, Research Engineer, Lecturer (512-418-0157) [kmfb98@hotmail.com] Ph. D.**,** University of Illinois**,** 1988**.** Radiation detection and measurement; advanced algorithms; analytical modeling; radioxenon sampling; monitoring; data analysis; radiochemical separation techniques; software and GUI developmentnon-proliferation; atmospheric radionuclide identification; analytical modeling. Professional Engineer.
Website: http://www.me.utexas.edu/~nuclear/index.php/faculty-and-staff/94-kendra-foltz-biegalski

John R. Howell, Professor (512-471-3095) **[**jhowell@mail.utexas.edu] Ph.D., Case Institute of Technology (now Case Western Reserve University), 1962. Radiative energy transfer; heat transfer in energy systems; heat transfer with combined modes; Monte Carlo Methods; inverse analysis techniques. Website: http://www.me.utexas.edu/~nuclear/index.php/faculty-and-staff/92-john-howell

Elmira Popova, Professor (512-471-3078) [elmira@mail.utexas.edu] Ph.D., Case Western Reserve University**,** 1995**.** Risk informed asset management for electric power generation; Uncertainty quantification; Energy pricing and load forecast**.** Website: http://www.me.utexas.edu/~popova/

Mitch Pryor (512-471-5182) [mpryor@mail.utexas.edu] Ph.D., The University of Texas, Austin, 2002. Decision-making, operation, and control of robotic systems.
Website: http://www.robotics.utexas.edu/people/mitch_pryor/index.htm

Nuclear Science and Engineering Research Centers

Nuclear Engineering Teaching Laboratory (NETL): Constructed in 1986 at the J.J. Pickle Research Campus, a separate research center of the University of Texas, featuring a 1 Megawatt TRIGA reactor. Areas of study include: health physics, radiation engineering, research reactor beam port experiments, radioactive waste management, reactor and computational nuclear engineering and environmental pathways.

UNIVERSITY OF UTAH

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	0	0	0	0	0
Masters	2	2	1	1	0
PhD	1	0	0	0	0

Graduate Student Enrollment: 4 Masters/7 Ph.D.
ABET Accreditation: Civil Engineering

Nuclear Science and Engineering Faculty

Tatjana Jevremovic, EnergySolutions Presidential Endowed Chair Professor and Director of Utah Nuclear Engineering Program (801-587-9696) [Tatjana.Jevremovic@utah.edu] Ph.D., The University of Tokyo, 1993. Nuclear reactor simulation and modeling; radiation transport modeling and applications; Nuclear forensics and nuclear safeguards; Nuclear materials detection, simulation and modeling; Nuclear medicine; Radiation in space; Advanced visualizations of nuclear engineering software with accelerations; Environmental engineering.

Haori Yang, Assistant Professor **(**801-587-3066) **[**haoriyang@gmail.com] Ph.D.**,** University of Michigan, Ann Arbor**,** 2009**.** Detector design and development, investigation of active interrogation technology and applications, radiation imaging systems, waste assay technologies, radiation monitoring systems, nuclear instrument and control system. Website: www.nuclear.utah.edu

Other Faculty

Dong-Ok Choe, Assistant Research Professor/TRIGA Reactor Supervisor **(**801-587-3066) [d.choe@utah.edu] Ph.D. University of Utah, 2000. Reactor physics, dose reconstruction, fission track analysis. Website: www.nuclear.utah.edu

Nuclear Science and Engineering Research Centers

Advanced Radiation Simulation Laboratory (ARSiL): The advanced computational modeling group of ARSiL is developing novel methodologies based on the Method of Characteristics and the theory of R-

functions. The synergism of various methods is named AGENT, for Arbitrary GEometry Neutron Transport.

Radiation Detection and Measurement Laboratory (RaDeMeL): RaDeMeL research is focused at advancements of radiation measurements, techniques and instrumentations in addition to numerical simulations using MCNP.

UTAH STATE UNIVERSITY

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heng.ban@usu.edu
Website: www.mae.usu.edu

Graduate Student Enrollment: 7 Masters/7 Ph.D.
ABET Accreditation: Mechanical Engineering

Nuclear Science and Engineering Faculty

Heng Ban, (435-797-2098) [heng.ban@usu.edu] Ph.D., University of Kentucky, 1994. Thermophysical properties of materials, fluid dynamics at micro- and nano-scale, and energy and environmental aspects of coal and biomass utilization.

VIRGINIA COMMONWEALTH UNIVERSITY

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401 West Main Street
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	7/10-6/11	7/11-6/12
B.S.	0	9
Masters	13	7
PhD	0	0

Graduate Student Enrollment: 15 Masters/3 Ph.D.
ABET Accreditation: B.S. in Mechanical Engineering

Nuclear Science and Engineering Faculty

Sama Bilbao y Leon, Associate Professor and Director of Nuclear Engineering Programs (804-828-2570) [sbilbao@vcu.edu] Ph.D., University of Wisconsin, Madison, 1999. Experimental and computational thermal-hydraulics, two-phase flow and heat transfer for nuclear applications.

Brian Hinderliter, Associate Professor (701-237-6550 [bhinderliter@vcu.edu] Ph.D.**,** University of Virginia, 2000. Corrosion; Materials; Radiation Transport. Professional Engineer.

James T. McLeskey, Associate Professor (804-827-7008) [jtmcleskey@vcu.edu] Ph.D. Energy conversion systems.

Gary Tepper, Professor and Interim Chair (804-827-4079) [gctepper@vcu.edu] Ph.D. Radiation detection; nanoscale materials.

Amy Throckmorton, Assistant Professor (804-827-2278) [althrock@vcu.edu], PhD. Medical devices; fluid dynamics.

Other Faculty

Ross Anderson, Associate Professor (804-827-4000) [rcanderson@vcu.edu] Ph.D. Nuclear Engineering.

James Miller, Instructor (804-827-4000) [jgmiller@vcu.edu] M.S., Pennsylvania State University, 1975. Nuclear Simulators. Professional Engineer.

Nuclear Science and Engineering Research Centers

Specialized nuclear engineering laboratories include a reactor simulator and a table-top visible reactor. Other relevant research centers within the School of Engineering include a Nanomaterials Characterization Center (NCC) and the Virginia Microelectronics Center (VMC).

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Nuclear Science and Engineering Faculty

Alireza Haghighat, Professor (571-858-3333) [haghighat@vt.edu] Ph.D., University of Washington, 1986. Research in particle transport methods and their applications in simulation of nuclear systems, parallel computing for nuclear applications. Monte Carlo methods, reactor physics, perturbation techniques, design of nondestructive interrogation systems for homeland security applications, simulation of nuclear reactors, radiation systems, and medical devices.

Mark Pierson, Associate Professor (540-231-9112) [mark.pierson@vt.edu] Ph.D., Virginia Polytechnic Institute, 2005. Conducting neutron irradiation of carbon nanotubes and graphene sheets at the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory. Pre- and post-irradiation examination (PIE) using Raman spectroscopy, TEM imaging, and four-point probe electrical resistance measurements will characterize the type of damage and resilience to damage. Research may lead to new radiation detection sensors or reactor pressure vessel radiation dose sensors. Further investigations are starting in nano-fission materials and nano-nuclear batteries.

Leigh Winfrey, Assistant Professor and Director of Nuclear Engineering Programs (540-231-1988) [leigh.winfrey@vt.edu] Ph.D., North Carolina State University, 2010. Plasma physics; High energy density plasmas; Fusion reactor fueling; Plasma materials interactions; Nuclear materials.

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	07/07-06/08	07/08-6/09	7/09-6/10	7/10-6/11	7/11-6/12
B.S.	19	17	17	20	12
Masters	18	15	12	26	24
PhD	9	8	9	9	3

Graduate Student Enrollment: 34 Masters/56 Ph.D.
ABET Accreditation: Nuclear Engineering

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Matt S. Allen, Professor (608-890-1619) [msallen@engr.wisc.edu] Ph.D.**,** Georgia Institute of Technology**,** 2005**.** Dynamics, vibrations and controls; micro/nano systems; uncertainty and stochastic systems; linear/nonlinear system identification; model reduction/substructuring. Website: http://www.engr.wisc.edu/ep/faculty

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Center for Plasma-Aided Manufacturing

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UW Energy Institute

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