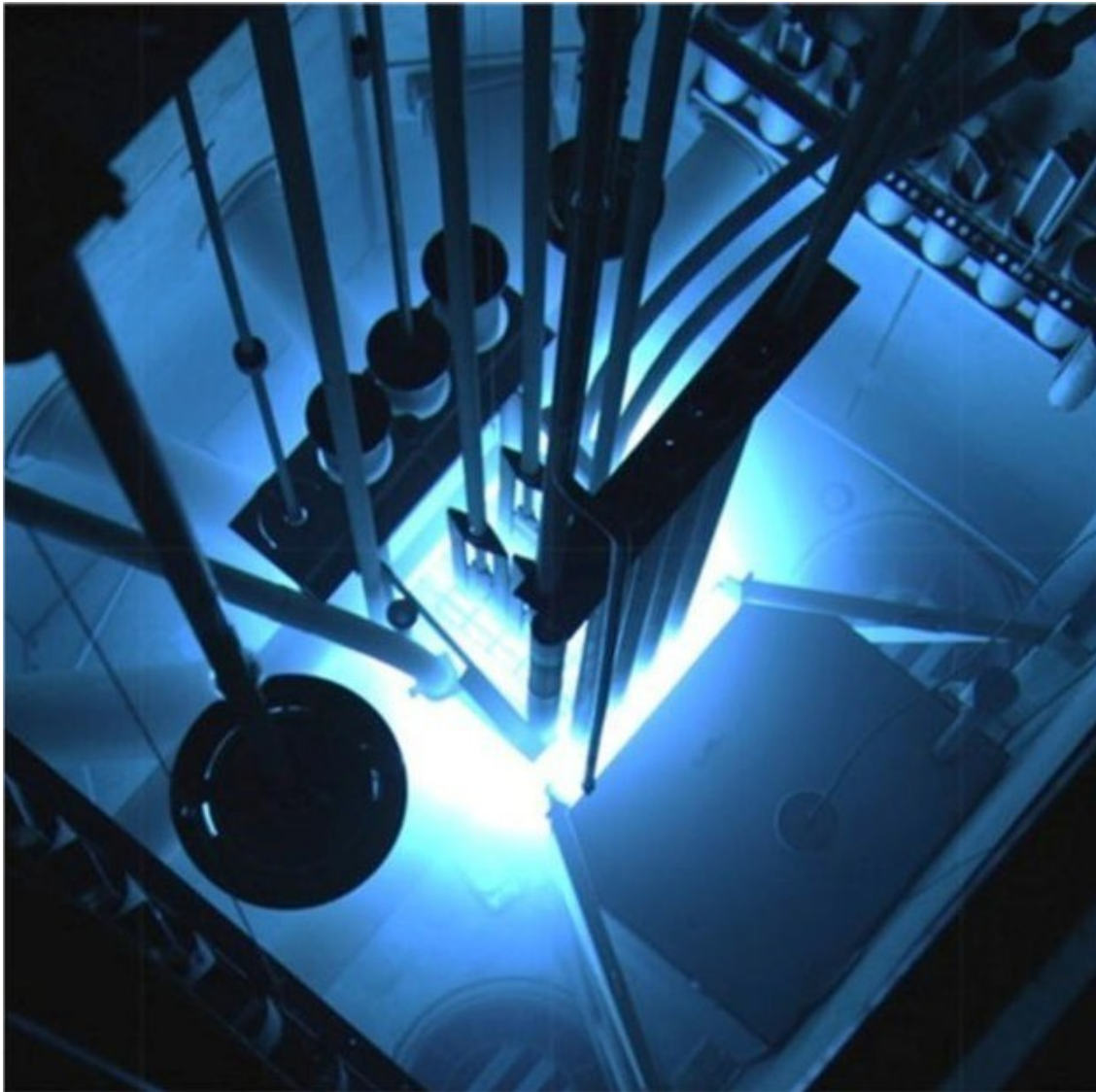


2026 Nuclear Science and Engineering Education Sourcebook



U.S. DEPARTMENT OF
ENERGY



Welcome to the 2026 Edition of the Nuclear Science and Engineering Education (NS&EE) Sourcebook. We keep evolving and improving! 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.

We will publish a PDF version of the Sourcebook noted below. 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 University Reactors. The Sourcebook data will be placed on the web at the Nuclear Energy University Programs (NEUP) site (www.neup.gov) and on the DOE-NE website. The Sourcebook is usually printed on even years. When printed, copies are 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 US DOE Office of Nuclear Energy and 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. Beth Fernandez for accumulating the Sourcebook information and for maintenance of the Sourcebook website.

We are excited to present the 2026 Edition of the NS&EE Sourcebook (Version 1.26) available in PDF file format and on the web at www.neup.gov > Documents > Nuclear Science and Engineering Sourcebook.

To update information, please contact Assistant Editor, Ms. Beth Fernandez at bethfernandez@ncsu.edu.

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CLEMSON UNIVERSITY

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	7/24-6/25	7/25-6/26
Masters	4	1
Ph.D.	3	1

Number of Graduates

Graduate Student Enrollment 7 Masters/33 Ph.D.

Nuclear Science and Engineering Faculty

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Website: <https://cecas.clemson.edu/ceramicmaterials4energy/>

Timothy A. DeVol, Toshiba Professor of Nuclear Engineering (864-656-1014) [devol@clemson.edu] Ph.D., University of Michigan, 1993. Radiation detection and measurements; environmental health physics, homeland security; radiation damage.

Website: <https://www.clemson.edu/cecas/departments/ees/people/facultydirectory/devol.html>

Shanna L. Estes, Assistant Professor (864-656-3065) [sestes@clemson.edu] Ph.D., Clemson University, 2014. Actinide chemistry; solution thermodynamics; molecular structure; radioanalytical instrumentation; nuclear waste separations; radioactive waste disposal.

Website: <https://www.clemson.edu/science/academics/departments/chemistry/about/profiles/sestes>

Luiz G. Jacobsohn, Associate Professor (864-656-5965) [luiz@clemson.edu] D. Sc., Pontifical Catholic University of Rio de Janeiro, Brazil, 1999. Luminescent Materials; Scintillators; Luminescent Dosimeters; Interaction of Ionizing Radiation with Matter; Radiation Damage; Synthesis and Processing of Ceramic Materials; Structure-Property Relationships.

Website: <https://www.clemson.edu/cecas/departments/mse/people/faculty/jacobsohn.html>

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Other Faculty

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Robert A. Fjeld, Emeritus Dempsey Professor (864-656-3276) [fjeld@clemson.edu] Ph.D., The Pennsylvania State University, 1976. Environmental aspects of nuclear technologies; transport and measurement of radio nuclides in the environment, with a specific emphasis on the behavior and subsurface transport of radionuclides at Department of Energy sites. Professional Engineer.

Website: <https://www.clemson.edu/cecas/departments/ees/people/emeritus/fjeld.html>

Scott M. Husson, William B. “Bill” Sturgis, ’57 & Martha Elizabeth “Martha Beth” Blackmon Sturgis Annual Distinguished Professor in Chemical & Biomolecular Engineering (864-656-4502) [shusson@clemson.edu] Ph.D., University of California at Berkeley, 1998. Advanced separation materials; bioseparations; WaterEnergy Nexus. Website: https://www.clemson.edu/cecas/departments/chbe/people/husson_s.html

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Andrew R. Metcalf, Associate Professor (864-656-0464) [ametcal@clemson.edu] Ph.D., California Institute of Technology, 2012. Air pollution and air quality, with a particular focus on atmospheric aerosol particles; developing methods to collect atmospheric aerosol particles; microfluidics. Website: <https://www.clemson.edu/cecas/departments/ees/people/facultydirectory/metcalf.ht ml>

Fei Peng, Associate Professor (864-656-4134) [fpeng@clemson.edu] Ph.D., Georgia Institute of Technology, 2009. Advanced Uranium Fuel Fabrication; Smart Embedded Strain Sensors for Joint Replacement; Laser-Based Additive/Subtractive Manufacturing of Ceramic Devices; Microstructure Prediction and Engineering Using Machine Learning and Artificial Intelligence; Thermal and Mechanical Properties of Materials; Sintering and Grain Growth; High-Temperature Kinetics and Microstructure. Website: <https://www.clemson.edu/cecas/departments/mse/people/faculty/peng.html>

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Nuclear Science and Engineering Research Laboratories

Radiochemistry Preparation and Analyses Laboratories: Clemson University is licensed by the South Carolina Department of Health and Environmental Control to conduct research with a range of fission/activation products (for example, ^3H , ^{57}Co , ^{60}Co , ^{90}Sr , ^{99}Tc , ^{137}Cs), uranium isotopes (^{232}U , ^{233}U , ^{234}U , ^{235}U , and ^{238}U), and transuranics (^{238}Pu , ^{239}Pu , ^{240}Pu , ^{241}Pu , ^{242}Pu , ^{241}Am , ^{237}Np , ^{244}Cm , ^{252}Cf). The Environmental Engineering & Earth Sciences department maintains three radiochemistry laboratories within the Linvil G. Rich Environmental Laboratory plus six radiochemistry laboratories and two radioecology laboratories in the adjacent Clemson Environmental Technology Laboratory. These include a teaching laboratory, a low-level counting laboratory for environmental samples, three radiation detection and measurement laboratory, multiple radiochemical separation laboratories equipped for working with sealed and unsealed sources. These laboratories total up to approximately 2500 ft² of space. Additionally, the laboratories have HEPA filtered anaerobic chambers and glove boxes as needed to perform work in inert atmospheres.

For a complete list go to <https://www.clemson.edu/cecas/departments/eees/research/equipment.html>

Clemson Electron Microscope Facility is a general user facility that will be fully utilized for examination of surface precipitation and generation of elemental maps of metal distribution across the mineral phases used in this work. There are multiple instruments but a few notes that can be utilized for studies with radioisotopes

General Analytical Laboratories: In addition to the radiochemistry laboratories, several dedicated laboratories including an instrument room, an organic separations laboratory, a biotechnology laboratory, a laminar-flow clean room, and a two-story open-bay laboratory, and numerous general-purpose laboratories are located in the facility. Also included are research support areas, including a darkroom, an autoclave and media preparations room, and a gas cylinder storage area. A loading dock for receiving supplies and environmental samples is conveniently located adjacent to the various storage rooms.

Computational Mineralogy and Geochemistry Laboratory is housed in EEES and currently has four dual monitor workstations. Students use these computers to construct files, analyze data, and connect to the Palmetto Cluster. Palmetto is Clemson University's primary high-performance computing (HPC) resource; heavily utilized by researchers, students, faculty, and staff from a broad range of disciplines. Currently, Palmetto is comprised of 1786 compute nodes (totaling 34916 CPU cores)

Machine Shops: A moderate scale machine shop for fabrication of experimental apparatus. This is accessible free of charge to all departmental faculty. The Clemson College of Engineering, Computing and Applied Sciences also has a full-scale machine shop capable of production of high-quality materials with high precision. This shop is available to all faculty on a per hour fee basis.

COLORADO SCHOOL OF MINES

Nuclear Science and Engineering Program

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	7/24-6/25	7/25-6/26
Masters	14	9
Ph.D.	1	2

Number of Graduates

Graduate Student Enrollment: 22 Masters/ 16 Ph.D.

Nuclear Science and Engineering Faculty

Mark Jensen, Program Director, Professor and Jerry and Tina Grandey University Chair in Nuclear Science and Engineering (303-273-3785) [mjensen@mines.edu] Ph.D., Florida State University, 1994. Nuclear fuel cycle; chemical separations; biochemistry and environmental chemistry of the transuranium elements.

Website: <https://chemistry.mines.edu/project/jensen-mark/>

Thomas Albrecht, University Distinguished Professor and Director, Nuclear Science and Engineering Center (303-384-2101) [thomas.albrecht@mines.edu] Ph.D., Northwestern University, 1997.

Heavy element chemistry and bonding; nuclear materials; x-ray diffraction.

Website: <https://chemistry.mines.edu/project/albrecht-thomas/>

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Understanding the broader impacts of Advanced Nuclear Fuel Cycles.

Website: <https://mechanical.mines.edu/project/deinert-mark/>

Uwe Greife, Professor (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: <https://physics.mines.edu/project/greife-uwe/>

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2021. Methodologies for time-dependent particle transport and Multiphysics analysis of nuclear reactors.

Website: <https://mechanical.mines.edu/project/mascolino-valerio/>

Andrew G. Osborne, Associate Professor (303-384-2003) [osbornea@mines.edu] Ph.D., University of Glasgow, 2006. Nuclear reactor theory; nuclear fuel cycles; reactor optimization; numerical methods; energy systems analysis. Website: <https://mechanical.mines.edu/project/osborne-andrew/>

Jenifer C. Shafer, Professor and Ben L. Fryrear Presidential Chair (303-273-3996) [jshafer@mines.edu] Ph.D., Washington State University, 2010. Actinide separations; molten salt chemistry; nuclear forensics. Website: <https://chemistry.mines.edu/project/shafer-jenifer/>

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 used for teaching and research 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 2.2×10^6 n/cm²-s with an effective L/D of approximately 200.

Laboratory for Applied & Environmental Radiochemistry (LAER) – Located on the Mines Campus, the Laboratory for Applied & Environmental Radiochemistry (LAER) is a multi-user facility well equipped for use and analysis of radioactive materials, especially transuranic elements. Our emphasis is on understanding the behavior of radionuclides relevant to nuclear energy. Capabilities include all forms of radioactive counting, alpha and gamma spectroscopy, UV-visible spectroscopy calorimetry, biochemistry, chemical synthesis, and all types of chemical separations.

GEORGIA INSTITUTE OF TECHNOLOGY

Nuclear and Radiological Engineering and Medical Physics Programs

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	7/24/25	7/25/26
B.S.	18	17
Masters	39	28
Ph.D.	8	11

Number of Graduates

Graduate Student Enrollment: 47 Masters/ 40 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 www.dlpe.gatech.edu

Nuclear Science and Engineering Faculty

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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.

Shaheen A. Dewji, Assistant Professor (404-894-5800) [shaheen.dewji@gatech.edu] Ph.D., Georgia Institute of Technology, 2014. Nuclear engineering; health physics; radiation protection; computational dosimetry; nuclear medicine; radiation detection and simulation; gamma spectroscopy; nuclear safeguards; gamma-ray spectroscopy; emergency response. Website: <https://sites.gatech.edu/dewji/>

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Dan Kotlyar, Associate Professor [dan.kotlyar@me.gatech.edu] Ph.D., Ben-Gurion University of the Negev, 2013, Development of advanced numerical methods and algorithms for fuel depletion and thermal hydraulic coupled Monte Carlo codes. Research in fuel cycle analysis, advanced reactor design, and system-level analysis

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Other Faculty

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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.

Margaret E. Kosal, Associate 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.

Choonsik Lee, Adjunct Professor; Medical Physicist, Division of Cancer Epidemiology and Genetics, National Cancer Institute, National Institutes of Health (240-381-5474) [choonsik.lee@nih.gov] Ph.D., Hanyang University, 2002; medical radiation dosimetry; computational human phantoms; Monte Carlo radiation transport

Jolinta Lin, Assistant Professor in Department of Radiation Oncology at Emory University, Adjunct Assistant Professor at Georgia Institute of Technology, M.D., University of Maryland School of Medicine, understanding mechanisms of toxicity from radiation therapy, identifying potential pathways to decrease side effects, and improving patients' quality-of-life issues.

Liyong Lin, Adjunct Professor (404-251-2848) [llin30@emory.edu] Ph.D., FAAPM, DABR, University of Wisconsin-Madison, 2006. Proton Therapy: Monte Carlo Treatment Planning, Simulation, Commissioning and Quality Assurance; FLASH and LET optimization and delivery; Detection technique and data Processing; Proton imaging includes AI processing; Clinical trial design.

Farshad Mostafaei, Assistant Professor and Director of Research in the Radiation Oncology Department & Associate Director of Medical Physics Residency Program, Augusta University, Adjunct Assistant Professor at Georgia Tech (706-446-5345) [fmostafaei3@gatech.edu], Ph.D., McMaster University, 2015. Certified by the American Board of Radiology – Therapeutic Medical Physics. Dosimetry, Motion Management, Ultrasound, Image-guided radiation therapy (IGRT) & Brachytherapy.

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.

Pretash Patel, Assistant Professor of Radiation Oncology, Emory University School of Medicine; Adjunct Assistant Professor at Georgia Tech (404-778-3473) [pretesh.patel@emory.edu] M.D., Duke University, 2008. HDR brachytherapy in gynecological and genitourinary malignancies; advancements in clinical and technical aspects of SBRT; use of information technology to improve quality and safety in oncology clinical practice.

Justin Roper, Medical Physicist, Hospital Corporation of America, Adjunct Assistant Professor at Georgia Tech (404-894-1044) [justin.roper@emory.edu] Ph.D., Duke University, 2010. Certified by the American Board of Radiology - Therapeutic Medical Physics 2013; image guided radiation therapy, functional and molecular imaging as a means to design treatments based on the biology of cancer and normal tissue.

Lawrence P. Rubin, Associate 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.

Joseph Shelton, Assistant Professor Department of Radiation Oncology at Emory University, Adjunct Assistant Professor at Georgia Institute of Technology, M.D., University of North Carolina. The treatment and outcomes of patients with gynecologic and genitourinary malignancies. Current work focuses on the development of new treatment strategies combining modern radiotherapy and chemotherapy in post-cystectomy bladder cancer patients. Other work involves investigating strategies for adapting brachytherapy and external beam radiation treatments to improve outcomes in cervical cancer patients.

Weston M. Stacey, Jr., Emeritus 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.

Adam N. Stulberg, 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.

Kyle H. Turner, Chief Executive Officer, McCallum-Turner, Inc., Adjunct Professor at Georgia Tech (303-670-8797) [turner@mccallumturner.com] Ph.D., Georgia Institute of Technology, 1972. Conduct of operations; nuclear safety management, nuclear enterprise management.

Rachel Whitlark, Associate Professor, [rachel.whitlark@inta.gatech.edu] Ph.D. George Washington University 2014, International security, international relations, foreign-policy decision-making, nuclear weapons and proliferation, military intervention, U.S. foreign and national security policy, grand strategy, defense policy, qualitative methods.

Xiaofeng Yang, Assistant Professor in Department of Radiation Oncology at Emory University, Director of Medical Physics Residency Program, Adjunct Assistant Professor at Georgia Institute of Technology, Ph.D. Xi'an Jiaotong University, 2006. Medical imaging, image-guided radiotherapy, machine learning, medical image analysis, and prostate cancer.

Shannon Yee, Assistant Professor [shannon.yee@me.gatech.edu] Ph.D., University of California Berkeley, 2013. Heat transfer, energy systems, direct energy conversion, thermoelectrics, and thermal energy conversion.

Jun Zhou, Adjunct Assistant Professor, Associate Professor Emory School of Medicine, Ph.D., Tsinghua University, proton treatment planning, proton stereotactic body radiotherapy (SBRT), proton arc therapy, proton imaging and image-guided adaptive radiotherapy.

Ting Zhu, 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

Radiological Science and Engineering Laboratory: [www.rsel.gatech.edu] (404-894-3606) 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 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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Nuclear Engineering

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	7/24-6/25	7/25-6/26
B.S.	12	15
Masters	7	5
Ph.D.	0	1

Number of Graduates

Graduate Student Enrollment: 30 Masters/ 15 Ph.D.

ABET Accreditation: B.S. in Nuclear Engineering

Nuclear Science and Engineering Faculty

Chad L. Pope, Department Chair and Professor (208-282-2875) [popechad@isu.edu] Ph.D., Idaho State University, 2011. Nuclear Safety.

Amir Ali, Associate Professor (208-553-8113) [aliamir@isu.edu] Ph.D., University of New Mexico, 2013. Thermal-hydraulics.

Mary Lou Dunzik-Gougar, Professor and Associate Dean (208-533-8111) [mldg@isu.edu] Ph.D., Pennsylvania State University, 2003. Nuclear Fuel Cycle.

Daniel LaBrier, Associate Professor (208-533-8165) [labrdani@isu.edu] Ph.D., Idaho State University, 2013. Nuclear Materials.

Other Faculty

Bob Boston, (208-533-4250) [bostonrd@id.doe.gov] MS, Idaho State University. U.S. Department of Energy. Reactor safety and regulations. Professional Engineer.

Kermit Bunde, Adjunct Faculty [kermitbunde@isu.edu] MS, Idaho State University, Monte Carlo. Michael Calley, Adjunct Faculty [michaelcalley@isu.edu] MS, Idaho State University, risk analysis.

George R. Imel, Emeritus (208-705-2344) [gimel@isu.edu] Ph. D., Pennsylvania State University, 1971. Reactor Physics.

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

Emerald Ryan, Adjunct Faculty [emeraldryan@isu.edu] PhD, Idaho State University, reactor physics.

Richard Schultz, Adjunct Research Professor (208-521-5605) [srr@srv.net] Ph.D. Idaho State University, 2010. Idaho National Laboratory Thermal hydraulics experimentation, instrumentation, and analysis. Reactor safety analysis. Professional Engineer.

Ryan Stewart, Adjunct Faculty [ryanstewart@isu.edu] PhD, Oregon State University, reactor physics.

Nuclear Science and Engineering Research Centers

AGN-201M, 5 W Reactor Laboratory: Administrator: Mary Lou Dunzik-Gougar Ph.D. (208-533-8111) [mldg@isu.edu] Lillibridge Engineering Laboratory, Pocatello, ID 83209-8060. Used for training and research. In operation since 1957.

Subcritical Assembly Laboratory: HALEU-AR plates with water moderation. Used for approach-to- critical demonstration and research. In operation since 1961.

KANSAS STATE UNIVERSITY

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	7/24-6/25	7/25-6/26*
B.S.	18	27
Masters	2	5
Ph.D.	1	1

Number of Graduates

Graduate Student Enrollment: 5 Masters/10 Ph.D.

ABET Accreditation: ME

**Estimated*

Nuclear Science and Engineering Faculty

Amir A. Bahadori, Nuclear Engineering Program Director and Professor (785-370-1374) [bahadori@ksu.edu] Ph.D., University of Florida, 2012. Characterization of radiation environments; response of humans to radiation exposure; radiation imaging.
Website: <http://www.mne.k-state.edu/people/faculty/bahadori/>

Ronnie Brockhoff, Teaching Assistant Professor (785-532-5610) [rcb7777@ksu.edu], Ph.D., Kansas State University, 2004. Focus on Mechatronics, Robotics, and programming techniques for solving complex problems in Mechanical and Nuclear Engineering.

Carlos E. Castano, Associate Professor (785-532-5610) [cecastano@ksu.edu] Ph.D., Missouri University of Science and Technology (Missouri S&T), 2014. Surface science; functional coatings; materials for energy applications; materials under extreme environments (Irradiation, Plasmas, and High Temperatures); advanced manufacturing; critical materials. Website: <https://www.mne.k-state.edu/about/people/faculty/castano/>

Alan Cebula, Nuclear Reactor Facility Manager (785-532-6657) [alanc@ksu.edu] Ph.D., University of Florida, 2016. Reactor instrumentation, controls, and measurements; neutron and photon imaging; nuclear medicine physics and instrumentation.
Website: <https://www.mne.k-state.edu/research/reactor/experiment-facilities>

Arsen S. Iskhakov, Assistant Professor (984-255-3069) [aiskhak@ksu.edu], Ph.D., North Carolina State University, 2023. Nuclear thermal hydraulics; numerical modeling; machine learning; nuclear reactor design and safety. Website: <https://www.mne.k-state.edu/about/people/faculty/iskhakov/>

Douglas S. McGregor, University Distinguished 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>

Walter McNeil, Associate Professor (785-532-5610) [wmcneil@ksu.edu] Ph.D., Kansas State University, 2010. Radiation sensor design, signal formation modeling, readout system design, and system integration; radiological field measurements, radiation background monitoring, and harsh environment sensors. Website: <https://www.mne.k-state.edu/about/people/faculty/mcneil/>

Jeremy Roberts, Associate Professor (785-532-5610) [jaroberts@ksu.edu] Ph.D., Massachusetts Institute of Technology, 2014. Computational nuclear engineering; reactor physics; neutron transport (both deterministic and stochastic); optimization, sensitivity and uncertainty analysis. Website: <http://www.mne.ksu.edu/people/faculty/roberts>

Jessika Rojas, Associate Professor (785-532-5610) [jvrojas@ksu.edu], Ph.D., Missouri University of Science and Technology (Missouri S&T), 2014. Radiation chemistry and processing, radiochemistry, nanomanufacturing and radiopharmaceuticals, nuclear materials. Website: <https://www.mne.k-state.edu/about/people/faculty/rojas/>

Nuclear Science and Engineering Research Centers

NanoNuclear Materials & Processing Lab: The NanoNuclear Materials & Processing Lab focuses on advancing non-conventional fields of radiation science and technology that directly impact materials science and engineering, with applications spanning nanomanufacturing, environmental systems, and medicine. The lab explores radiation-induced synthesis of nanomaterials, modification of materials' properties through ionizing radiation, and the physicochemical responses of nanocomposites to ionizing radiation, and advances understanding of nuclear materials at the nanoscale in extreme environments.

Radiological Engineering Analysis Laboratory: The Radiological Engineering Analysis Laboratory (REAL) focuses on characterization of radiation environments, understanding the response of humans and electronics to radiation exposure using both experimental and computational techniques, and radiation imaging. Specific projects include collaboration on advanced space radiation detection instruments for the Artemis missions and development of novel active-shielding architectures to enable long-term exploration missions to the moon and Mars; Department of Energy-funded work through the Plant-Directed Research and Development Program at the Kansas City National Security Campus; and development of new analytical tools for the Million Person Study, which aims to better understand the health effects of chronic exposure to ionizing radiation in the workplace.

Computational tools include NASA's HZETRN code, Geant4, PHITS and MCNP. The REAL also has extensive physical dosimetry capabilities, including a Hars 5500 thermoluminescent dosimeter reader, a programmable annealing oven, an RadSource RS1800 x-ray irradiator, and an XRad-320 x-ray irradiator with OptiMAX imager.

Radiological Systems Integration Lab: The Radiological Systems Integration Lab (RSIL) develops various radiation sensors with integrated readout including semiconductor, scintillator, and gas-type sensors for gamma-ray spectroscopy, neutron counting, and dosimetry. RSIL develops innovative sensing instrumentation for remote and rugged environments leveraging miniaturization, portability, and power reduction needed for military, domestic security, and human health monitoring. RSIL has neutron and gamma-ray irradiation facilities including DD and DT neutron generators in bare and heavily moderated environments including in-pool. RSIL has custom in-house fabrication capability including PCB design/fabrication, SiPM mounting, and precision metal fabrication for custom miniature enclosures. Modeling capability includes radiation transport coupled with optical photon transport and multi-physics modeling of mobile ion transport in gas and semiconductor devices.

SMART Laboratory: The Semiconductor Materials and Radiological Technologies (S.M.A.R.T.) Laboratory at Kansas State University is a unique facility dedicated to the research and development of new and innovative radiation detector technologies. A variety of detectors are investigated and fabricated, which include compact low-power neutron detectors, high-resolution room-temperature-operated semiconductor gamma ray spectrometers, pixelated devices for gamma ray or neutron imaging, and miniaturized gas-filled detectors.

SurfACE Lab: The Surface And Coatings Engineering Laboratory focuses on tailoring the surface properties of materials by physical and chemical methods for engineering applications. The research areas are organized around four main fields: Nanotechnology, Surface Science, Functional Coatings, and Material under Extreme Environments (Irradiation, Plasmas, and High Temperatures).

Thermal-hydraulics Research and AI for Nuclear (TRAIN) Lab: Thermal-hydraulics Research and AI for Nuclear (TRAIN) Lab advances the field of nuclear reactor thermal hydraulics by integrating modeling and experimentation with machine learning and artificial intelligence methods. We seek to improve reactor design, performance, and safety through detailed investigations of critical single- and two- phase flow phenomena. The TRAIN Lab supports research across both current light-water reactors and advanced reactor technologies.

TRIGA Mark II Nuclear Reactor Facility: The Kansas State University TRIGA Mark II nuclear reactor facility supports training, research, industry, and outreach activities. The reactor is licensed to operate at up to 1.25 MW steady state with pulsing up to 3.00 reactivity (~1 GW).

Reactor capabilities include a variety of irradiation facilities and neutron beams for detector and materials testing, internal imaging through neutron radiography and tomography, tracer isotope production, and trace element analysis via neutron activation analysis. Various photon irradiation capabilities at the facility include - high dose rate gamma irradiation following reactor operations utilizing activation and fission product decay; low dose rate gamma irradiation utilizing calibrated Cs- 137 and other isotope sources; and x-ray irradiation utilizing a self-shielded cabinet x-ray system.

Training is provided through reactor operation and laboratory classes. The facility employs undergraduate student operators, providing both an excellent opportunity for the students and supporting workforce development in nuclear science and engineering.

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	7/24/25	7/25/26
B.S.	15	1
Masters	21	15
Ph.D.	8	5

Number of Graduates

Graduate Student Enrollment: 20 Masters/ 112 Ph.D.

ABET Accreditation:

Bachelor of Science (BS) Degree in Nuclear Science and Engineering

Nuclear Science and Engineering Faculty

Benoit Forget, Department Head of Nuclear Science and Engineering and KEPCO Professor of Nuclear Engineering and (617-253- 1655) [bforget@mit.edu] Ph.D., Georgia Institute of Technology, 2006.

Computational transport theory; Reactor Physics and Nuclear Fuel Cycle. Website:

<https://nse.mit.edu/people/benoit-forget/>

Emilio Baglietto, Norman C Rasmussen Professor of Nuclear Science and Engineering, and Associate Department Head of Nuclear Science and Engineering (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: <https://nse.mit.edu/people/emilio-baglietto/Matteo> Bucci, Esther and Harold E. Edgerton Associate Professor and Professor of Nuclear Science and Engineering (617-253-2336) [mbucci@mit.edu] Ph.D., University of Pisa, Italy, 2009.

Multi-phase flow and heat transfer; Reactor thermal-hydraulics; Nanotechnologies for advanced heat transfer; Integration of sensors, simulations and machine learning tools.

Website: <https://nse.mit.edu/people/matteo-bucci/>

Jacopo Buongiorno, Battelle Energy Alliance Professor of Nuclear Science and Engineering; Professor of Mechanical Engineering; Member for the US National Academy of Engineering (617-253-7316) [jacopo@mit.edu] Ph.D., Massachusetts Institute of Technology, 2000. Multi-phase flow and heat transfer; innovations in nuclear fission technology; nuclear economics and policy; advanced reactor design; reactor thermal hydraulic. Website: <https://nse.mit.edu/people/jacopo-buongiorno/>

Paola Cappellaro, Ford Professor of Engineering, Professor of Nuclear Science and Engineering and Professor of Physics (617-253-8137) [pcappell@mit.edu] Ph.D., Massachusetts Institute of Technology. Quantum control; quantum information; precision measurement; nuclear magnetic resonance. Website: <https://nse.mit.edu/people/paola-cappellaro/>

Areg Danagoulian, Associate Professor of Nuclear Science and Engineering (617-324-6329) [aregjan@mit.edu] Ph.D., University of Illinois at Urbana-Champaign, 2006. Nuclear security; arms control; non-proliferation; nuclear safeguards. Website: <https://nse.mit.edu/people/areg-danagoulian/>

Zachary Hartwig, Associate Professor of Nuclear Science and Engineering (617-253-5471) [hartwig@mit.edu] Ph.D., Massachusetts Institute of Technology, 2013. Head of the PSFC Engineering Group. Superconducting magnet engineering; Radiation damage in materials; Radiation detection; Ion accelerators. Website: <https://nse.mit.edu/people/zachary-hartwig/>

Sophia Henneberg, Norman Rasmussen Career Development Professor Assistant Professor of Nuclear Science and Engineering (617-253-9718) [sophia_h@mit.edu] Ph.D., University of York, 2017. Stellarator Design and Optimization, Stellarator-Tokamak Hybrids, Magnetohydrodynamics. Website: <https://nse.mit.edu/people/sophia-henneberg/>

Ericmoore Jossou, John Clark Hardwick (1986) Assistant Professor of Nuclear Science and Engineering and Assistant Professor of Electrical Engineering and Computer Science (617-253-3810) [ejossou@mit.edu] Ph.D., University of Saskatchewan, 2019. Radiation damage in nuclear materials; X-ray scattering and imaging methods; Nuclear fuels. Website: <https://nse.mit.edu/people/ericmoore-jossou/>

R. Scott Kemp, Associate Professor of Nuclear Science and Engineering (617-324-3308) [rsk@mit.edu] Ph.D., Princeton University, 2010. National security, nonproliferation, and arms control policy; verification techniques; energy policy and climate change. Website: <https://nse.mit.edu/people/r-scott-kemp/>

Richard K Lester, Japan Steel Industry Professor; Professor of Nuclear Science and Engineering; Faculty Chair, Industrial Performance Center (617-253-7704) [rklester@mit.edu] Ph.D., Massachusetts Institute of Technology, 1979. Innovation strategy and management; nuclear technology management and control; energy/climate innovation policy. Website: <https://nse.mit.edu/people/richard-k-lester/>

Ju Li, Carl Richard Soderberg Professor of Power Engineering at Departments of Nuclear Science and Engineering and Materials Science and Engineering, as well as a core faculty member of MIT Schwarzman College of Computing (CCSE) (617-253-0166) [liju@mit.edu] Ph.D., Massachusetts Institute of Technology, 2000. Energy materials ranging from high-temperature, radiation- and corrosion-resistant alloys for nuclear fission and fusion reactors, to materials used in electrolyzers and batteries, AI for science. Website: <https://nse.mit.edu/people/ju-li/>

Mingda Li, Associate Professor of Nuclear Science and Engineering (617-452-2505) [mingda@mit.edu] Ph.D., Massachusetts Institute of Technology, 2015. Neutron and X-ray scattering. Topological materials. Machine learning. Website: <https://nse.mit.edu/people/mingda-li/>

Ethan Peterson, Class of 1956 Career Development Professor, Assistant Professor of Nuclear Science and Engineering [peterson@psfc.mit.edu] Ph.D., University of Wisconsin—Madison, 2019. Fusion reactor design and analysis; radiation transport methods; fusion neutronics validation; uncertainty quantification. Website: <https://nse.mit.edu/people/ethan-peterson/>

Dean Price, Atlantic Richfield Career Development Professor in Energy Studies and Assistant Professor of Nuclear Science and Engineering (617-253-3808) [dnprice@mit.edu] Ph.D., University of Michigan, 2024. Computational reactor physics; scientific machine learning and artificial intelligence; multiphysics simulation; reactor dynamics and control; verification and validation. Website: <https://nse.mit.edu/people/dean-price/>

Koroush Shirvan, Atlantic Richfield Chair Development Professor, Associate Professor of Nuclear Science and Engineering (617-452-3017) [kshirvan@mit.edu] Ph.D., Massachusetts Institute of Technology, 2012. Nuclear reactor design; Nuclear fuel performance; Reactor safety; Advanced energy systems. Website: <https://nse.mit.edu/people/koroush-shirvan/>

Michael Short, Professor of Nuclear Science and Engineering (617-324-6329) [hereiam@mit.edu] Ph.D., Massachusetts Institute of Technology, 2010. Mesoscale nuclear materials, corrosion and fouling; radiation damage quantification. Website: <https://nse.mit.edu/people/michael-short/>

Curtis L. Smith, KEPCO Professor of the Practice of Nuclear Science and Engineering (208-201- 9110), Ph.D. Massachusetts Institute of Technology, Cambridge, 2002. Applied engineering applications within the nuclear & aerospace industries, risk-informed decision making, nuclear systems analysis, probabilistic risk analysis. Website: <https://nse.mit.edu/people/curtis-smith/>

George Tynan, Norman C. Rasmussen Adjunct Professor of Nuclear Science and Engineering, [gtynan@mit.edu], Ph.D. Applied Plasma Physics, UCLA 1991. Turbulence and Transport in Confined Plasmas; Plasma-material interactions; Energy Systems and Deep Decarbonization. Website: <https://nse.mit.edu/people/george-tynan/>

Haruko Murakami Wainwright, Mitsui Career Development Professor in Contemporary Technology, Assistant Professor of Nuclear Science and Engineering, and Assistant Professor of Civil and Environmental Engineering [hmwainw@mit.edu], PhD University of California, Berkeley, 2010, Nuclear waste and contamination; environmental monitoring; computational groundwater hydrology; environmental informatics. Website: <https://nse.mit.edu/people/haruko-wainwright/>

Anne E. White, Professor of Nuclear Science and Engineering, MIT School of Engineering Distinguished Professor of Engineering, Associate Vice President for Research Administration (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: <https://nse.mit.edu/people/anne-white/>

Dennis G. Whyte, Hitachi America Professor of Engineering, Professor of Nuclear Science and Engineering (617-253-1748) [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: <https://nse.mit.edu/people/dennis-whyte/>

Bilge Yildiz, Breene M. Kerr (1951) Professor of Nuclear Science and Engineering and Professor of Materials Science and Engineering (617-324-4009) [byildiz@mit.edu] Ph.D., Massachusetts Institute of Technology, 2002. Electrochemical materials and interfaces; electrochemical energy conversion by fuel cells, electrolyzers, membranes; corrosion and hydrogen resistant films in extreme environments; electrochemical energy storage by solid state batteries; neuromorphic computing materials; redox based memristive information storage and processing; cation based memristive information storage and processing; ceramics; surface science; computational materials science; synchrotron and scanning probe experiments. Website: <https://nse.mit.edu/people/bilge-yildiz>

Other Faculty

Ronald G. Ballinger, Professor Emeritus 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: <https://nse.mit.edu/people/ronald-g-ballinger/>

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.

Charles W. Forsberg, Principal 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, fluoride-salt-cooled high-temperature reactors, and development of global nuclear-renewables energy systems (100-GWh heat storage and cellulosic hydrocarbon biofuels). Website: <https://nse.mit.edu/people/charles-forsberg/>

Jeffrey P. Freidberg, Professor Emeritus of Nuclear Science and Engineering (617-253-8670) [jpfreid@mit.edu] Ph.D., Polytechnic Institute of Brooklyn, 1964. Plasma Physics; Fusion Technology.

Michael W. Golay, Professor Emeritus of Nuclear Science and Engineering (617-253-5824) [golay@mit.edu] Ph.D., Cornell University, 1969. Nuclear power innovation, risk and regulation, non-proliferation. Founder of MIT-INPO reactor technology course.
Website: <https://nse.mit.edu/people/michael-w-golay/>

Linn W. Hobbs, Professor Emeritus of Nuclear Science and Engineering and Materials Science and Engineering Emeritus (617-253-6835) [hobbs@mit.edu] D.Phil., Oxford University, UK 1972. Radiation effects in materials (principally ceramics, but also metals and organics); extended defects and non-stoichiometry in nonmetallic solids; atomistic and topological modeling of glass structures; high-temperature corrosion; orthopaedic biomaterials and biomineralization.

Ian H. Hutchinson, Professor Emeritus of Nuclear Science and Engineering (617-253-8670) [ihutch@mit.edu] Ph.D., Australian National University, 1976. Plasma physics and controlled fusion.

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; application of formal risk analysis to nuclear arms negotiations.
Website: <https://nse.mit.edu/people/richard-landa/>

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, Professor of the Practice Emeritus of Nuclear Science and Engineering (208-757-8103) [kord@mit.edu] Ph.D., Massachusetts Institute of Technology, 1980. Reactor analysis methods; computational methods; high performance computing (HPC)s.
Website: <https://nse.mit.edu/people/kord-smith/>

Neil E. Todreas, Professor Emeritus of Nuclear Science and Engineering and Professor Emeritus of Mechanical Engineering (617-253-5296) [todreas@mit.edu] Sc.D. Reactor engineering; reactor thermal analysis; heat transfer and fluid flow. Website: <https://nse.mit.edu/people/neil-todreas/>

Sidney Yip, Professor Emeritus of Nuclear Science and Engineering and Professor Emeritus of Materials Science and Engineering (805-563-1730) [syip@mit.edu] Ph.D., University of Michigan, 1962. Computational materials science, multiscale molecular simulations.
Website: <https://nse.mit.edu/people/sidney-yip/>

Nuclear Engineering Research Centers

Center for Advanced Nuclear Energy Systems (CANES)

[<http://energy.mit.edu/research/future-nuclear-energy-carbon-constrained-world/> ; <https://energy.stanford.edu/news/extending-diablo-canyon-nuclear-plant-would-help-california-meet-its-climate-goals-new-study>] Director, Professor Jacopo Buongiorno (NSE). CANES has four research themes: Near-term Innovations in Fission Systems, Inventing the Future of Fission, working at the Foundations of Nuclear Energy Technology and Educating the Community/Informing the Policy. Ongoing projects cover the full spectrum of fission energy technology and policy from Advanced Reactors to Nuclear Fuel Cycles, from Enhanced Plant Performance to Nuclear Energy and Sustainability. The Center offers five short summer professional courses: Nuclear Systems Safety, Nuclear Energy: Key Facts and Issues, Reactor Technology for Power Plant Executives, Nuclear Technology for Marine Propulsion, and Probabilistic Methods for Nuclear Plant Management. Annual Research Expenditure: >\$10M. The Center completed the seminal study on the Future of Nuclear Energy in a Carbon-Constrained World in 2018 and the Assessment of the Diablo Canyon Nuclear Plant for Zero-Carbon Electricity, Desalination in 2021.

MIT Nuclear Reactor Laboratory (6 MW reactor)

[<http://nrl.mit.edu/>; <https://www.youtube.com/watch?v=5QcN3KDexcU>] Directors, Dr. Gordon Kohse, Prof. Jacopo Buongiorno, Dr. Lance Snead . The MIT NRL is an interdepartmental center that operates a high performance 6 MW nuclear research reactor known as the MIT Reactor (MITR), which is a partner of the Department of Energy's National Science User Facilities. The MITR is a light-water cooled and moderated, heavy-water reflected, reactor that utilizes flat, finned, aluminum-clad, plate- type, fuel elements. The average core power density is about 70 kW per liter. The maximum fast and thermal neutron flux available to experimenters are 1.2×10^{14} and 6×10^{13} neutrons/cm²-s, respectively. Experimental facilities available at the MITR include several beam ports, automatic transfer facilities (pneumatic tubes), graphite-reflector irradiation facilities and a cubic-meter-sized irradiation space with a fission spectrum but at reduced flux. In addition, several types of in-core experimental facilities are available, e.g., a pressurized-water loop capable of reproducing the temperature, pressure, flow, neutron flux and water chemistry conditions of a commercial power reactor. Focus is on advanced materials, fuel and instrumentation irradiation tests, reactor physics modeling, neutron beam applications, neutron activation analysis, advanced x-ray and neutron imaging. The MITR is also used to support lab courses, irradiation services, student operator training and public outreach activities.

Plasma Science and Fusion Center

[<http://psfc.mit.edu/>] Interim Director, Dr. Steven Wukitch. The Plasma Science and Fusion Center is a multidisciplinary research facility exploring plasma physics, fusion science, and their real -world applications, including the realization of practical fusion energy. The PSFC's research portfolio encompasses work centered around plasma theory and computation; magnetic confinement fusion energy; fusion technology; high-energy density physics; and magnet technology. A growth in collaborations with private industry groups have enabled the PSFC to expand and deepen its research into high-temperature superconducting magnets, stellarators, deep geothermal drilling, levitated dipole fusion, and neutron irradiation, among other topics

Nuclear Science and Engineering Research Laboratories

Center for Science and Technology with Accelerators and Radiation (CSTAR)

[<https://cstar.mit.edu/home.php>] CSTAR is dedicated to advancing nuclear science and engineering through the development and application of particular accelerators, particle detectors, and linear plasma devices.

Concrete Sustainability Hub

[<http://cshub.mit.edu/>] The MIT Concrete Sustainability Hub, CSHub, is a dedicated interdisciplinary team of researchers from several departments across MIT working on concrete and infrastructure science, engineering, and economics since 2009. The MIT CSHub brings together leaders from academia, industry, and government to develop breakthroughs using a holistic approach that will achieve durable and sustainable homes, buildings, and infrastructure in ever more demanding environments.

H.H.Uhlig Corrosion Laboratory

[<http://uhliglab.scripts.mit.edu/>] The H. H. Uhlig

Corrosion Lab investigates the causes of failure in materials and the prevention of failure in materials, with an emphasis on nuclear materials.

Computational Fluid Dynamics Research Group

[<https://baglietto.mit.edu/>] The CFD group in NSE focuses on the advancement of single and multiphase closure models that incorporate novel physical understanding that more generally represent the complex anisotropic nature of the mass, momentum and heat flux processes. The objective is to deliver advances in computational fluid flows and heat transfer simulations, which will benefit the operation and safety of the current nuclear reactor fleet, and support the deployment of next generation nuclear power systems.

Laboratory for Applied Nuclear Physics (LANPh)

[lanph.mit.edu] Director: Prof. Areg Danagoulian, NSE. The research at the Laboratory for Applied Nuclear Physics is focused on using nuclear physics techniques to find technological solutions for societal problems. These include nuclear nonproliferation, technologies for treaty verification, nuclear safeguards, and cargo security

Laboratory for Nuclear Innovation in Fission Technologies (NIFT) [<http://web.mit.edu/kshirvan/www/>]

NIFT focuses on acceleration of innovations in nuclear fission technology by utilizing an integrated system - level approach. Innovation is the key for unlocking nuclear energy technology potential for deployment and to support its sustainability. The innovations at NIFT are based on three pillars: artificial intelligence, additive manufacturing and high performing materials. NIFT uses a multi-disciplinary approach including detailed economics and regulatory assessment to quantify the impact of innovations and formulate accelerated pathways for their adoption.

Laboratory for Electrochemical Interfaces

[<http://web.mit.edu/yildizgroup/LEI/index.html>] Director: Professor Bilge Yildiz (NSE/DMSE). The lab's research focuses on laying the scientific groundwork and proof-of-principle material systems for the next generation of high-efficiency devices for energy conversion and information processing, based on solid state ionic-electronic materials

Laboratory for Nuclear Security and Policy (LNSP)

[<http://lnsp.mit.edu>] Director, R. Scott Kemp (NSE). LNSP is home to interdisciplinary research that aims to solve the social challenges arising from nuclear technologies. Research has focused in areas such as the detection of nuclear proliferation, the proliferation risk of emerging fuel-cycle technologies, verification technologies for arms control treaties, and the detection of smuggled nuclear material in cargo. LNSP researchers combine a broad range core analytical methods, ranging from low-energy nuclear physics to information science, and history to international politics.

Laboratory for Innovation in Fusion Technologies (LIFT)

The Laboratory for Innovations in Fusion Technologies (LIFT) is dedicated to exploring disruptive technology solutions for fusion energy with private-sector sponsors within the broader framework of the PSFC, NSE, and the MIT Energy Initiative. Research topics include materials, liquid-immersion blankets and fusion fuels. Commonwealth Fusion Systems and ENI are present sponsors.

Laboratory for Thermal-Hydraulics Engineering and Design (The Red Lab)

The laboratory for Thermal- Hydraulics Engineering and Design is dedicated to exploring the fundamentals and the application of advanced heat transfer solutions for power technology. The research portfolio includes the development of high-resolution diagnostics and data processing tools, first-of-a-kind experimental capabilities, heat transfer enhancement techniques, and modeling approaches.

MIT Computational Reactor Physics Group (CRPG)

[<http://crpg.mit.edu/>] CRPG focuses on the development of novel methods and algorithms for accurate and efficient nuclear reactor simulations. Better simulations help the nuclear industry set well-informed safety margins, but also enable assessment of innovative new fuel and reactor designs. From accurate quantification of uncertainty of neutron cross sections to Exascale simulation of nuclear systems, computing is pushing the boundaries of reactor physics.

Quantum Engineering Group [<http://qeg.mit.edu>] Director: Professor Paola Cappellaro (NSE). The Quantum Engineering Group develops transformative tools based on the fundamental laws of quantum physics, with applications in quantum simulation of complex systems, quantum computation beyond current classical limits, and quantum sensing of atomic- scale phenomena in the physical and life sciences.

The Quantum Measurement Group [<https://qm.mit.edu/>] The Quantum Measurement Group aims to develop innovative materials characterization techniques. Our research primarily employs x-ray, neutron, and electron spectroscopies to probe the microscopic interaction mechanisms within quantum materials. These investigations focus on the intricate interplay between charge, orbital, spin, and lattice degrees of freedom, aiming to advance energy and information technologies. Our group specializes in studying topological materials, which exhibit unique properties due to their topological nature. These materials hold promising potential for energy and information applications. We grow high-quality single crystalline and nanostructured crystals of these materials, conduct high-precision thermal transport measurements in the quantum realm, and apply advanced spectroscopic probes to study their fundamental excitations at spatial-temporal scales that are otherwise challenging to achieve.

Additionally, we integrate artificial intelligence with theoretical models to analyze our experimental data and propose novel measurement methodologies. This synergistic approach ensures a collaborative environment, fostering partnerships both within the group and with researchers worldwide.

Collaborating MIT Academic & Research Units

Computer Science and Artificial Intelligence Laboratory (CSAIL) [<https://www.csail.mit.edu/>] Laboratory for Nuclear Science [<http://web.mit.edu/lns/>]

Research Laboratory of Electronics [<https://www.rle.mit.edu/>]

McMASTER UNIVERSITY

Engineering Physics
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FAX: 905-527-8409
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905-525-9140
Website: www.eng.mcmaster.ca/engphys

	7/246/25	7/256/26
B.S.	0	0
Masters	15	15
Ph.D.	10	10

Number of Graduates

Graduate Student Enrollment: Masters/ Ph.D.

Distance Education Program
Offers Nuclear Engineering Courses and
Degrees Online Through the University Network of Excellence in Nuclear Engineering
(www.unene.ca)

Nuclear Science and Engineering Faculty

Adriaan Buijs (905-525-9140 x24925) [buijsa@mcmaster.ca] Ph.D., Utrecht University, 1987. The physics of nuclear reactor cores, in particular of Small and Very Small Modular Reactors; Development of analysis tools for research in reactor physics. Website: www.eng.mcmaster.ca/engphys/people/faculty/adriaan-buijs

Goran Calic, Associate Professor (765-421-6136) [calicg@mcmaster.ca] Ph.D., Purdue University, 2016. Nuclear strategy; nuclear construction performance; organizational learning in nuclear; reactor - design standardization; risk-adjusted LCOE; nuclear project finance; small modular reactors (SMR); SMR social acceptance and legitimacy; nuclear workforce planning; nuclear supply chain; heavy forgings and reactor pressure vessels; deep geological repository siting; real -options analysis; digital twins for nuclear construction; AI/RAG for nuclear regulatory compliance; energy system resilience; cooling-water and climate adaptation; Indigenous community energy; comparative nuclear energy policy. Website: <https://degroote.mcmaster.ca/profiles/calicg/>

Pat Clancy, Associate Professor (905 525-9140) [clancyp@mcmaster.ca] Ph.D. McMaster, 2011, Materials characterization using neutron beams, Neutron Scattering, Neutron Diffraction, Neutron Spectroscopy, Neutron Attenuation, Nuclear Materials, Quantum Materials, Structural and Magnetic Properties, Materials under extreme conditions.

Website: <https://experts.mcmaster.ca/people/clancyp>

John C. Luxat, Professor (905-525-9140 x 24670) [luxatj@mcmaster.ca] Ph.D., University of Windsor, 1972. Nuclear safety; severe accidents; thermalhydraulics; advanced fuel cycles; safety analysis methodology; reactor core physics. Professional Engineer. Website: www.eng.mcmaster.ca/engphys/people/faculty/john-luxat

David R. Novog, Professor (905-525-9140) [novog@mcmaster.ca] Ph.D., McMaster University, 1999. Nuclear safety; thermalhydraulics; reactor physics; reactor control; uncertainty analysis; safety system design and performance; critical heat flux; computational fluid dynamics; computer code coupling. Professional Engineer. Website: www.eng.mcmaster.ca/engphys/people/faculty/Dave-Novog

Nana Ofori-Opoku, Assistant Professor (905-525-9140) [noforiopoku@mcmaster.ca]. Ph.D., McMaster University, 2013. Nuclear materials; irradiation effects and defect evolution in structural alloys; phase-field and multiscale modelling of microstructure evolution; solidification and additive manufacturing; radiation damage and materials performance under extreme environments; computational materials science; high-performance scientific computing.

Website: <https://www.eng.mcmaster.ca/materials/faculty/dr-nana-ofori-opoku/>

Suraj Persaud, Associate Professor (647-894-8762) [persas39@mcmaster.ca]. Ph.D., P.Eng. University of Toronto, 2015.

Expertise: Corrosion, stress corrosion cracking, electron microscopy, surface science, electrochemistry. Materials for nuclear applications: current plants, nuclear waste, and advanced reactors.

Markus H.A. Piro, Associate Professor (905-525-9140) [pirom@mcmaster.ca] Ph.D., Royal Military College of Canada, 2011. Nuclear fuels; Nuclear Materials. Website: <https://www.eng.mcmaster.ca/engphys/>

Stephen Veldhuis, Professor (905 525-9140) [veldhu@mcmaster.ca] Ph.D. McMaster, 1998, Advanced Materials and Manufacturing, CNC Machining, Lean Manufacturing, Tooling and Process Optimization, Surface Engineering, PVD Coatings, Material Property Assessment under extreme conditions (High temperature, heavy load and harsh environments), Industry 4.0, industrial Internet of Things (IIoT), 5G, Condition-Based Monitoring and Performance Assessment, Advanced Analytics using Artificial Intelligence (AI) / Machine Learning (ML), Productivity Quality and Cost Reduction, Product and Process Innovation. Website: <https://www.eng.mcmaster.ca/mech/faculty/dr-stephen-c-veldhuis/>

Michael Joshua Welland, Associate Professor (613-281-7991) [wellandm@mcmaster.ca] Ph.D., Royal Military College of Canada, 2009. Nuclear materials; AI in energy; Computational Materials Science
Website: www.mikewelland.com

Other Faculty

Simon Day, Adjunct Professor, Engineering Physics (905-525-9140 x23191) [dayse@mcmaster.ca] Ph.D., McMaster University, 2003. Reactor Physics with specialties in Safety Analysis, Operations Support, and Criticality Safety. Leading the Reactor Analysis group at the McMaster Nuclear Reactor.

Laurence Leung, Adjunct Professor, Ph.D., Ottawa. Manager, Advanced Concepts & Collaboration at Canadian Nuclear Laboratories (retired) [leungl@sympatico.ca].
Website: experts.mcmaster.ca/display/leungl1

Thambiayah Nitheanandan, Industry Professor, Director, Canadian Nuclear Safety Commission. Ph.D., Manitoba. [nitheant@mcmaster.ca]. Website: experts.mcmaster.ca/display/nitheant

Nik Popov, Adjunct Professor, Program Director at University Network of Excellence in Nuclear Engineering (UNENE) Ph.D., Zagreb. [npopov@mcmaster.ca] experts.mcmaster.ca/display/npopov

Ben Rouben, Adjunct Professor, Ph.D. (Massachusetts Institute of Technology), Reactor Physics, [roubenb@alum.mit.edu]. Website: experts.mcmaster.ca/display/roubeb1

Victor G. Snell, Industry Professor (905-525-9140 x20168) [snellv@mcmaster.ca], Ph.D., University of Toronto, 1972. Nuclear safety concepts and philosophy, safety system design and performance, safety analysis, education of staff working in the nuclear industry, nuclear licensing.
Website: experts.mcmaster.ca/display/snellv

Peter Vilks, Adjunct Professor (204-753-2311 ext. 63172) [peter.vilks@cnl.ca] Ph.D., McMaster University, 1984. Geochemistry and transport of radionuclides such as sorption, colloids, natural organics and diffusive and advective processes in fractures and rock matrix.

Nuclear Science and Engineering Research Centers

The Centre for Advanced Nuclear Systems (CANS) is a specialized nuclear material science hub engineered to investigate how extreme radiation alters the physical properties of nuclear components. Its core infrastructure centers on a Post-Irradiation Examination (PIE) Facility equipped with five high-gamma concrete hot cells, allowing for the safe remote handling, sectioning, and mechanical testing of highly radioactive materials like harvested reactor pressure tubes. To analyze radiation -induced degradation at the micro and nanoscale, CANS integrates advanced material characterization suites featuring a 3D atom probe, focused ion beam microscopy, and positron annihilation spectroscopy to map atomic-level defect voids.

<https://nuclear.mcmaster.ca/facilities-equipment/facility-list/centre-for-advanced-nuclear-systems/>

McMaster Manufacturing Research Institute (MMRI) is a state-of-the-art applied research and innovation centre that offers advanced material property assessment, design, prototyping, manufacturing scale up and optimization and innovation services and training opportunities. We provide the materials and manufacturing industry with access to cutting-edge technology and equipment, as well a multi-disciplinary team with the expertise to solve real-world problems, overcome barriers and turn brilliant ideas into reality.

Website: <https://www.eng.mcmaster.ca/mmri-home/>

The Canadian Centre for Electron Microscopy (CCEM) is a world-class research facility that provides unparalleled access to advanced electron and ion microscopy instrumentation, expertise, and training. We offer a comprehensive suite of services — from nano-scale materials characterization and imaging to industry analysis and collaborative research — supported by a highly skilled team of scientists and technical staff. Whether you are an academic researcher, industry partner, or emerging scientist, CCEM connects you with cutting-edge technology and the knowledge to transform your materials challenges into breakthrough discoveries. Website: <https://ccem.mcmaster.ca/>

The Canadian Neutron and Positron Beam Laboratory (CNPBL) is the only facility in Canada which provides access to neutron and positron beams for advanced materials research and characterization. At present, the CNPBL offers capabilities for neutron diffraction (single crystal, polycrystal, and powder samples), small angle neutron scattering, and neutron attenuation. These techniques are ideally suited to the study of nuclear materials (e.g. structural characterization, phase identification, sensitivity to light elements – H, Li, bulk properties, evolution of structural properties as a function of temperature and pressure). Website: <https://nuclear.mcmaster.ca/neutron-beams/>

The High Level Laboratory Facility (HLLF) located within McMaster University's Nuclear Research Building, is a 16,000-square-foot suite that holds Canada's largest consolidated license and the only facility of this magnitude at a University in Canada. Equipped with state-of-the-art infrastructure - including remote neutron irradiation capabilities, research hot cells for nuclear materials and radioisotope development, 3 radiopharmaceutical GMP clean rooms and a full radioanalytical suite (ICPMS, ICP OES, Gamma and Alpha Spectroscopy etc) - the facility supports critical, ongoing research in isotope development, health physics analysis, nuclear materials and advanced radiochemistry and radiobiology research.

Website: <https://nuclear.mcmaster.ca/facilities-equipment/facility-list/high-level-laboratory-facility/>

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Nuclear Engineering and Radiation Science

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Rolla, MO 65409

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Contact: Marjie Grimshaw

Grimshawm@mst.edu

Website: <http://nuclear.mst.edu>

	7/24-6/25	7/25-6/26
B.S.	23	22
Masters	3	2
Ph.D.	1	3

Number of Graduates

Graduate Student Enrollment: 10 Masters/ 14 Ph.D. ABET

ABET Accreditation: Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Science and Engineering Faculty

Joseph W. Newkirk, Department Chair and Professor (573-341-6294) [jnewkirk@mst.edu] Ph.D., University of Virginia, 1983. Additive manufacturing, powder metallurgy, wear and corrosion resistant alloys, high temperature materials, aerospace materials, nuclear materials, and heat treating.

Website: <https://sites.mst.edu/jnewkirk/>

Shradha Agarwal, Associate Professor, Ph.D., Helium mobility and its effects on the microstructure/physical properties of different advanced ultra-high temperature ceramics (TiC, ZrC and TiN), for their possible use in BISO (Bi-structural isotropic)/TRISO (Tri-structural isotropic) fuel forms for Gen. IV reactors.

Tayfun Akyurek, Assistant Professor (573-314-4348) [takyurek@mst.edu] Ph.D., Missouri University of Science and Technology, 2015. Spent fuel monitoring and investigation; fuel management; radiation measurements; small modular reactors.

Ayodeji B. Alajo, Associate Professor (573-341-6609) [alajoa@mst.edu] Ph.D., Texas A&M University, 2010. Nuclear systems design and modeling; Advanced fuel cycles; Nuclear waste minimization; Nuclear forensics. Website: <https://people.mst.edu/faculty/alajoa/index.html>

Carlos H. Castano, Associate Professor (573-341-6766) [castanoc@mst.edu] Ph.D., Nuclear Engineering, University of Illinois at Urbana Champaign, 2007. Nano particles with radiation, simulation nuclear systems, Nuclear Materials, Vacuum breakdown. Website: <https://people.mst.edu/faculty/castanoc/index.html>

Joshua P. Schlegel, Associate Professor (573-341-7703) [schlegelj@mst.edu] Ph.D. Purdue University, 2012. Two-phase flow experiments and modeling, nuclear reactor thermal hydraulics, heat transfer, fluid mechanics. Website: <https://people.mst.edu/faculty/schlegelj/index.html>

Subash Sharma, Associate Professor (573-341-4881) [subash.sharma@mst.edu] Ph.D., Purdue University, 2016. Fluid Mechanics; Heat and Mass Transfer; Boiling Heat Transfer; Computational Fluid Dynamics (CFD); Gas-Liquid Two-Phase Flow Experiments and Simulations; Thermal-Hydraulics and Reactor Safety for Fission and Fusion Energy Systems; Two-Phase Flow System instabilities; Two- Fluid Model and Drift Flux Model for Two-Phase flow; AI/ML applications for Nuclear Energy

Other Faculty

Muthanna Al-Dahhan, Curators' Distinguished Professor of Chemical & Biochemical Engineering (573- 341-7518) [aldahhanm@mst.edu] Ph.D., Washington University – Saint Louis, 1993. Reactor Engineering, Transport-Kinetic Integration, Advanced Measurement and Computational Techniques, Clean and Alternative Energy and Environment, Multiphase Reaction Engineering, and Advanced Measurement Techniques. Website: <https://works.bepress.com/muthanna-al-dahhan/>

Syed Alam, Assistant Teaching Professor (573-341-4881) [sbagqm@mst.edu] Ph.D., University of Cambridge, 2018. Radiation transport methods for reactor physics analysis; Design of advanced reactor core; Multiphysics for thermal-hydraulics coupling; Uncertainty quantification; Health physics. Website: <https://nuclear.mst.edu/facultystaffandfacilities/alam/>

Arezoo Emdadi, Assistant Professor (573-341-4796) [aen26@mst.edu] Ph.D., Missouri University of Science and Technology, 2018. Computational Mechanics and Material Science, Applied Mathematics, Phase-Field Modeling (Crack Propagation, Solidification, Oxidation), Phase-Field Crystal Modeling, Finite Element Method, and Fracture Mechanics. Website: <https://works.bepress.com/arezoo-emdadi/about/>

Mina Esmaeelpour, Assistant Professor (573-341-4407) [mina.esmaeelpour@mst.edu] Ph.D., Lehigh University, 2016. High-resolution displacement detection and instantaneous frequency detection, Photoacoustic gas sensing, Quantum entanglement in few-mode and multimode fibers, and High-resolution ultrafast time-stretch spectroscopy. Website: <https://sites.mst.edu/minae/>

Charmayne Lonergan, Assistant Professor (573-341-4480) [clongergan@mst.edu] Ph.D., Missouri University of Science and Technology, 2014. Glassy materials, high-temperature characterization, and optical material design/characterization.

Jason Lonergan, Assistant Research Professor (573-341-4486) [jmlr53@mst.edu] Ph.D., Missouri University of Science and Technology, 2014. Synthesis, structure, and property relationships of advanced ceramics, nuclear materials, and molten salts.

Joseph Smith, Professor & Laufer Endowed Chair in Energy (573-341-4294) [smithjoseph@mst.edu] Ph.D., Brigham Young University, 1990. Research focuses includes developing resilient hybrid energy systems with fossil, nuclear and renewable energy. Develops and applies multi-physics computational tools to analyze turbulent flow inside Small Modular Nuclear Reactors and to analyze dynamic behavior in large processing facilities including Foundries and Aluminum Smelters.

Website: <https://people.mst.edu/faculty/smithjose/index.html>

John Gahl, Professor (573-882-5238) [gahlj@missouri.edu] Ph.D., Texas Tech University. Nuclear Plasma and Beam Science, Material Science, Pulsed Power. Website:

<https://engineering.missouri.edu/faculty/john-gahl/>

Haiming Wen, Assistant Professor (573-341-6167) [wenha@mst.edu] Ph.D., University of California- Davis, 2012. Nuclear materials. Website: <http://people.mst.edu/faculty/wenha/index.html>

Ph.D., University of California-Berkeley, 1977. Nuclear materials, radiation effects, mechanical properties, nuclear plant life extension.

Website: <http://nuclear.mst.edu/facultystaffandfacilities/kumar/>

Arvind S. Kumar, Professor Emeritus (573-341-4747) [kumar@mst.edu]

Gary E. Mueller, Associate Professor Emeritus (573-341-4348) [gmueeller@mst.edu]

Nuclear Science and Engineering Research Centers

The Nuclear Reactor: The Missouri S&T Reactor (MSTR) 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 high quality hands-on laboratory, research and development, training, and project opportunities. MSTR uses High Assay Low Enriched Uranium (HALEU) fuel in a 30,000-gallon pool of water and is cooled by natural convection. The open pool design allows access to the reactor core where experiments and samples to be irradiated can be positioned, with flexible core configurations to support loading a variety of experimental facilities.

MSTR is equipped with a pneumatic sample irradiation system (rabbit), a neutron beam port that provides a collimated neutron beam, a thermal column, and multiple in-core wet/dry irradiation enclosures. Additionally, a counting laboratory is maintained at the facility, including modern gamma spectroscopy equipment (both scintillation and solid state), liquid scintillation counter, thermoluminescent dosimeter reader, and corresponding data acquisition systems. The reactor is open to the greater campus community for research, training, and outreach, and offers an operator licensure program for interested students and others. MSTR can support training and educational activities in-person and remotely via a distance education system.

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.

Advanced Radiography and Tomography Lab (ARTLAB): The Nuclear Engineering ARTLAB is designed to perform radiation imaging for medical or industrial purposes. 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 research includes 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.

NEW MEXICO STATE UNIVERSITY

Chemical & Materials Engineering

P.O. Box 30001 MSC 3805

Las Cruces, NM 88003

Contact: Joseph H. Holles

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jholles@nmsu.edu

	7/24-6/25	7/25-6/26
Undergraduate Minor	5	8

Number of Graduates

ABET Accreditation: Chemical Engineering with a minor in Nuclear Chemical Engineering

<https://chme.nmsu.edu/academics/minors/nuclear-chemical-engineering.html>

Distance Education: All nuclear courses offered online

Nuclear Science and Engineering Faculty

Joseph H. Holles, Academic Department Head and Robert Davis Distinguished Professor (575-646-9837) [jholles@nmsu.edu] Ph.D., Chemical Engineering, University of Virginia 2000. Nuclear workforce development; heterogeneous catalysis. Professional Engineer
Website: <https://chme.nmsu.edu/FacultyDirectory/dr-joseph-holles-2.html>

Paul Andersen, Associate Professor of Chemical and Materials Engineering (575-646-8153) [pka@nmsu.edu] Ph.D., Chemical Engineering, University of California-Berkeley 1987. Lead instructor for nuclear related coursework. Radioactive waste minimization, nuclear fuel cycles, process design and economics, electric power generation.

Catherine Brewer, Professor of Chemical and Materials Engineering, John Kaichiro Nakayama and Tome Miyaguchi Nakayama Endowed Professorship of the College of Engineering, (575-646-8637) [cbrewer@nmsu.edu] Ph.D., Iowa State University, 2012. Lead, NuChemE Pipeline project to expand the size and diversity of the available workforce with skills to manage radioactive tank waste through capacity building, interdisciplinary training, and hands-on experiences.

Frank Ramos, Professor of Geological Sciences, Johnson Chair of Geochemistry (575-646-2511) [framos@nmsu.edu] Ph.D., UCLA 2000. Interests that encompass geochemistry, radiogenic and stable isotope geochemistry, volcanology, ore genesis, and human and animal sciences. Interests include applying isotopes to address conventional and novel topics in the earth sciences and related fields.

Cory Windorff, Associate Professor of Chemistry (575-646-3703) [windorff@nmsu.edu] Ph.D., UC Irvine 2017. Synthetic inorganic group that focuses on the redox chemistry of the lanthanides, actinides, and transition metals. Focus on the fundamental synthesis, spectroscopy, and reactivity of these elements as it relates to problems in energy generation, separations, and the environment.

Corey Frank, Assistant Professor of Chemistry (575-646-4029) [cefrank@nmsu.edu] Ph.D., Rutgers 2020. Design and synthesis of new materials with interesting magneto-structural coupling behaviors and/or topologically non-trivial band features. We take inspiration from natural mineral structures, and we utilize a variety of techniques- from CVT and flux growth to high pressure/high temperature synthesis - to grow our crystals.

Lambis Papelis, Professor of Civil and Environmental Engineering, (575-234-5555) [lpapelis@nmsu.edu] Ph.D., Stanford 1992. Manager, Carlsbad Environmental Monitoring and Research Center: <https://cemrc.nmsu.edu/index.html> The CEMRC facility and staff provide support to WIPP, LANL, SNL, and the WIPP M&O primarily through site and environmental monitoring, in vivo bioassay, and scientific and laboratory support. Research interests include water chemistry and water quality, remediation of metal-contaminated waters, fate and transport of pollutants, including radionuclides, and interaction of potential contaminants with soils and aquifer materials.

Vimal Chaitanya, Professor of Mechanical Engineering (575-646-24810) [vimalc@nmsu.edu] Ph.D., Johns Hopkins, 1984. Director, Plutonium Workforce Development Institute (PWDI).

Other Faculty

Donovan Fuqua, Associate Professor Accounting and Information Systems (575-646-28120) [dfuqua@nmsu.edu] Ph.D., New Mexico State 2019. Predictive Analytics Supply Chain Networks Advanced Manufacturing

Faruk Arslan, Associate Professor, Accounting and Information Systems (575-646-19720) [farslan@nmsu.edu] Ph.D., in International Business, The University of Texas at El Paso 2015. Informed decision-making, the business value of information systems (I.S.), information security and privacy, adoption and diffusion of IS, and global diversity of I.S.

Victor Pimmentel, Associate Professor of Management (575-646-2793) [vip@nmsu.edu] Ph.D., Washington State University 2016. Supply chain/business analytics

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	7/24-6/25	7/25-6/26
B.S.	17	25
Masters	36	41
Ph.D.	15	16

Number of Graduates

Graduate Student Enrollment: 18 Masters/ 136 Ph.D.

ABET Accreditation: Bachelor of Science (BS)

Degree in Nuclear Engineering

Distance Education Program

Offers Nuclear Engineering Courses and Degrees Online

http://engineeringonline.ncsu.edu/PS/grad_degrees.html

Nuclear Science and Engineering Faculty

Steven C. Shannon, Department Head and Professor and (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: <https://www.ne.ncsu.edu/people/scshanno>

Dmitriy Y. Anistratov, 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: <https://www.ne.ncsu.edu/people/dyanistr>

Maria N. Avramova, Professor and University Faculty Scholar, Director of Consortium for Nuclear Power, Coordinator of CTF User's Group (919-513-6354) [mnavramo@ncsu.edu] Ph.D., Pennsylvania State University, 2007. Reactor thermal-hydraulics; core design; transient and safety analysis; multi - physics multi-scale simulations; verification and validation; uncertainty and sensitivity analysis. Website: <https://www.ne.ncsu.edu/people/mnavramo>

Yousry Y. Azmy, Duke Energy Distinguished Professor, Director of CNEC and NCSU NUC University Lead (919- 515-3385) [yyazmy@ncsu.edu] Ph.D., University of Illinois, Urbana-Champaign, 1985. Nuclear computational science; computational transport theory; multiprocessing. Website: <https://www.ne.ncsu.edu/people/yyazmy>

Alexander William Bataller, Assistant Professor (919-515-3612) [awbatall@ncsu.edu] Ph.D., University of California, Los Angeles, 2014. Dense plasmas; ultrafast spectroscopy; molten salts. Website: <https://www.ne.ncsu.edu/people/awbatall>

Benjamin W. Beeler, Assistant Professor (919-515-3737) [bwbeeler@ncsu.edu] Ph.D., Georgia Institute of Technology, 2013. Computational nuclear materials science; Next generation nuclear fuels; Molten salt systems for nuclear applications; radiation damage and defect evolution; Density functional theory; Molecular dynamics.

Igor A. Bolotnov, Professor (518-542-8939) [igor_bolotnov@ncsu.edu] Ph.D., Rensselaer Polytechnic Institute, 2008. Multiscale approaches for nuclear reactor simulations; development of new spectral cascade transfer multiphase flow. Website: <https://www.ne.ncsu.edu/people/iabolotn/>

Mohamed A. Bourham, Alumni Distinguished Graduate Professor of Nuclear Engineering (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: <https://www.ne.ncsu.edu/people/bourham>

Mihai A. Diaconeasa, Assistant Professor (919-515-3768) [madiacon@ncsu.edu] Ph.D., University of California, Los Angeles, 2017. Probabilistic risk assessment; dynamic probabilistic risk assessment; reliability analysis; resilient systems design; probabilistic physics of failure modeling; Bayesian inference. Website: <https://www.ne.ncsu.edu/people/madiacon>

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. Website: <https://www.ne.ncsu.edu/people/nam-din>

Jacob Eapen, Professor (919-515 5952) [jacob.eapen@ncsu.edu] Sc.D., Massachusetts Institute of Technology, 2006. Molecular and multiscale simulations; nuclear materials; radiation interactions with materials; computational material science; thermal and fluid transport. Website: <https://www.ne.ncsu.edu/people/jeapen/>

John G. Gilligan, Distinguished University Professor, 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: <https://www.ne.ncsu.edu/people/gilligan>

Robert Hayes, Associate Professor (919-515-2321) [rbhayes@ncsu.edu] Ph.D., University of Utah, 1999. Nuclear nonproliferation technologies; radiation detection; air monitoring; luminescence and magnetic resonance; Monte Carlo radiation transport modeling. Professional Engineer.
Website: <https://www.ne.ncsu.edu/people/rbhayes>

Jason Hou, Associate Professor, Director of Nuclear Reactor Program (919-513-6705) [jason.hou@ncsu.edu] Ph.D., Pennsylvania State University, 2013. Multi-physics reactor simulation; advanced reactors; in-core fuel management; fuel cycle analysis; uncertainty analysis; plant simulator.
Website: <https://www.ne.ncsu.edu/people/jasonhou/>

Kostadin N. Ivanov, Distinguished Professor (919-515-1466) [knivanov@ncsu.edu] Ph.D., Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, 1990. Nuclear reactor physics and multi-physics; nuclear core design and safety analysis; nuclear plantsimulations; validation and verification of multi-physics calculations; uncertainty quantification and propagation in modeling and simulation.
Website: <https://www.ne.ncsu.edu/people/knivanov>

Wen Jiang, Assistant Professor (919-515-5877) [wjiang8@ncsu.edu] Ph.D., Duke University, 2015. Advanced computational methods for nuclear material modeling; multi-physics and multi-scale simulations. Website: <https://ne.ncsu.edu/people/wjiang8/>

Djamel Kaoumi, Professor (919-515-2301) [dkaoumi@ncsu.edu] Ph.D., Pennsylvania State University, 2007. Metallic materials degradation in harsh environments; irradiation damage and effects in advanced alloys for structural and cladding applications; mechanical properties and deformation mechanisms of high - temperature; advanced alloys; characterization techniques of predilection.
Website: <https://www.ne.ncsu.edu/people/dkaoumi>

Elizabeth Kautz, Assistant Professor (919-515-1466) [ekautz@ncsu.edu] Ph.D., Rensselaer Polytechnic Institute, 2018. Laser produced plasmas and materials; laser-material interaction, hydrodynamics and chemistry evolution in laser produced plasmas; materials degradation phenomena.
Website: <https://ne.ncsu.edu/people/ekautz/>

Florian M. Laggner, Assistant Professor (919-513-3603) [fmlaggner@ncsu.edu] Ph.D., Technische Universität Wien, Austria, 2017. High temperature plasmas in magnetic confinement fusion devices; plasma edge physics and plasma diagnostics; confined plasma research; harsh environment of a fusion pilot plant. Website: <https://ne.ncsu.edu/people/fmlaggner/>

Amanda Lietz, Assistant Professor (919-515-3658) [alietz@ncsu.edu] Ph.D., University of Michigan, 2019. Computational modeling of low temperature plasmas; computational modeling of plasma sources; design and optimization of plasma sources. Website: <https://ne.ncsu.edu/people/alietz/>

Lisa M. Marshall, Assistant Extension Professor, Director of Outreach, Retention and Engagement, Associate Director of Undergraduate Programs, ANS 70th President (919-515-5876) [lisa.marshall@ncsu.edu] PhD ongoing at NC State University; Masters, UNC at Chapel Hill (2017). (Nuclear) engineering education; co-curricular scholarship; workforce development; stakeholder engagement; K-20 STEM education; energy geography; geographic information system. Website: <https://ne.ncsu.edu/directory/lisa-marshall/>

John K. Mattingly, Professor (919-515-0224) [john_mattingly@ncsu.edu] Ph.D., University of Tennessee, Knoxville, 1998. Neutron interrogation methods; estimation of SNM properties; 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: <https://www.ne.ncsu.edu/people/jkmattin>

Korukonda L. Murty, Progress Energy Distinguished Professor (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: <https://www.ne.ncsu.edu/people/murty>

Abderrafi Ougouag, Research Professor (866-495-7440) [amougoua@ncsu.edu] Ph.D., University of Illinois at Urbana-Champaign, 1986. Reactor physics; computational methods; reactor design and optimization. Website: <https://ne.ncsu.edu/people/amougoua/>

Scott Palmtag, Research Professor (919-865-6696) [sppalmta@ncsu.edu] Ph.D., Massachusetts Institute of Technology, 1997. Reactor physics; multiphysics applications; computational methods. Website: <https://ne.ncsu.edu/people/sppalmta/>

Katharina Stapelmann, Associate Professor, ABET Coordinator (919-515-5987) [kstapel@ncsu.edu] Ph.D., Ruhr University Bochum, Germany, 2013. Low-temperature plasma; plasma medicine; interactions of technical plasmas with biological systems; plasma diagnostics. Website: <https://ne.ncsu.edu/people/kstapel/>

Xu Wu, Assistant Professor (919-515-6570) [xwu27@ncsu.edu] Ph.D., University of Illinois at Urbana-Champaign, 2017. Calibration, Validation, Data Assimilation, Uncertainty and Sensitivity Analysis; Scientific Machine Learning; Computational Statistics and Reduced Order Modeling. Website: <https://www.ne.ncsu.edu/people/xwu27>

Ge Yang, Associate Professor (919-515-5267) [gyang9@ncsu.edu] Ph.D., Northwestern Polytechnical University, China, 2007. Novel materials for radiation sensor applications; effects of radiation on electronic, photonic and structural materials; radiation imaging and measurement. Website: <https://ne.ncsu.edu/people/gyang9/>

John Zino, Associate Teaching Professor (919-398-2832) [jzino@ncsu.edu] Ph.D., Georgia Institute of Technology, 1985. High-temperature advanced sodium fast reactor technologies; BWR systems engineering; nuclear methods and software; safety and radiological analysis. Website: <https://ne.ncsu.edu/people/jzino/>

Other Faculty

Joseph M. Doster, Professor Emeritus (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: <https://www.ne.ncsu.edu/people/doster>

Donald J. Dudziak, Professor Emeritus (505-667-7983) (505-661-3832) [dudziak@ncsu.edu, dudziak@lanl.gov] Ph.D., University of Pittsburgh, 1963. Transport and Reactor Theory. Professional Engineer.

David Kropaczek, Adjunct Professor [dkropac@ncsu.edu] Ph.D., North Carolina State University. Fuel cycle and plant optimization, computational reactor physics and thermal-hydraulics, and numerical algorithm development.

Michael Simpson, Adjunct Associate Professor (208-520-1068) Ph.D., Princeton University. Nuclear fuel cycle.

Matthew Stokely, Adjunct Associate Professor (919-619-3851) Ph.D., North Carolina State University. Advanced characterization methods.

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.

Paul J. Turinsky, Professor Emeritus (919-515-5098) [turinsky@ncsu.edu] Ph.D., University 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: <https://www.ne.ncsu.edu/people/turinsky/>

Kuruvilla Verghese, Professor Emeritus. Ph.D., Iowa State University. Reactor Engineering/Fuel Cycles.

Monroe Wechsler, Adjunct Professor (919-515-2301) Ph.D., Columbia University. Nuclear materials, radiation effects.

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 powder diffractometer, neutron imaging, and molten salt irradiation facility. Director: Dr. Jason Hou Website: nrp.ne.ncsu.edu

Consortium for Nuclear Power (CNP)

Director: Maria Avramova

Website: <https://www.ne.ncsu.edu/wp-content/uploads/2017/06/CNP-Flyer.pdf>

COBRA-TF (CTF)

Coordinator: Maria Avramova

Website: <https://ne.ncsu.edu/rdfmg/cobra-tf/>

DOE Workforce Development Center Consortium for Reactor Safety Training (CR ϵ ST).

Director: Jacob Eapen

The Consortium for Reactor Safety Training (CR ϵ ST) brings together a transformational team comprising educational institutions, training centers, reactor vendors, power utilities, national laboratories, research and non-profit organizations, labor organizations, and community representatives to develop a highly qualified, committed workforce to support the current and next-generation nuclear reactors.

Focusing on the Southeastern region of the U.S., home to 30 of the 94 operational nuclear reactors that generate approximately 30% of nuclear power, the CR ϵ ST team plans to unify a vast network of institutions with the common goal of addressing the current and projected worker shortfall in the nuclear power industry. CR ϵ ST is supported by the U.S. Department of Energy (DOE) and industry for a period of five years, starting in Fall 2026, with a total budget of \$36.7 Million.

THE OHIO STATE UNIVERSITY

Nuclear Engineering Graduate Program

201 West 19th Avenue

Columbus, OH 43210

Website: <http://mae.osu.edu/nuclear>

	7/24/25	7/25/26
Masters	3	0
Ph.D.	6	1

Number of Graduates

Graduate Student Enrollment: 3 Masters/ 18 Ph.D.

ABET Accreditation: Bachelor of Science (BS) Degree in Engineering with Nuclear Minor

Nuclear Science and Engineering Faculty

Lei (Raymond) Cao, Director of The Ohio State University Nuclear Reactor Laboratory and Professor (614-247-8701) [Cao.152@osu.edu] Ph.D., The University of Texas at Austin, 2007. Instrumentation and Sensors; In-pile Instrumentation; Radiation Detection; Neutron Radiography/Tomography; PGNA, NDP, Radiation Effects on Electronics. Website: <https://mae.osu.edu/people/cao.152>

Praneeth Kandlakunta, Research Assistant Professor (614-247-8439) [kandlakunta.1@osu.edu]. Ph.D., The Ohio State University, 2014. Nuclear instrumentation; Radiation Detection; Radiation Effects in Materials and Devices; High-efficiency fast-switching X-ray sources; X-ray imaging. Website: <https://mae.osu.edu/people/kandlakunta.1>

Marat Khafizov, Professor (614-292-2544) [Khafizov.1@osu.edu] Ph.D., University of Rochester, 2008. Radiation effects on physical properties of materials, nuclear fuel and ceramics, thermal transport, in-pile sensors, optical spectroscopy and ultrasonics. Website: <https://mae.osu.edu/people/khafizov.1>

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: <https://mae.osu.edu/people/smidts.1>

Richard Vasques, Associate Professor (510-340-0930) [vasques.4@osu.edu] Ph.D., University of Michigan, 2009. Particle transport; radiative transfer; mathematical and computational modeling of transport phenomena; reactor theory; acceleration schemes; diffusion theory. Website: <https://mae.osu.edu/people/vasques.4>

Dean Wang, Associate Professor (614-292-1337) [wang.12239@osu.edu] Ph.D., Massachusetts Institute of Technology, 2003. Transport Theory and Computation; Nuclear reactor design, modeling and simulation; Nuclear reactor systems and safety. Website: <https://ncg.engineering.osu.edu>

Taiyang Zhang, Assistant Professor, Ph.D. in Nuclear, Plasma, and Radiological Engineering, 2023, University of Illinois Urbana-Champaign. Flow Instability, Multi-Phase Flow Measurement and Modeling, Reduced Order Models in Reactor Systems, Thermal Hydraulics Experiment, Verification and Validation of System Codes. Website: <https://mae.osu.edu/people/zhang.15721>

Other Faculty

Tunc Aldemir, Professor Emeritus (614-292-4627) [aldemir.1@osu.edu] Ph.D., University of Illinois, 1978. Dynamic system reliability; probabilistic risk assessment. Website: <https://mae.osu.edu/people/aldemir.1>

Thomas E. Blue, Professor Emeritus (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; fiber-optics. Website: <https://mae.osu.edu/people/blue.1>

Richard Denning, Professor Emeritus (614-736-1793) [denningrs.8@gmail.com] Ph.D., University of Florida, 1967. Probabilistic Risk Assessment; Severe Accident Phenomena; Advanced Reactor Source Term Methodology; Regulatory Analysis.

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 and is a partner facility of DOE Nuclear Science User Facilities. The OSUNRL houses the OSURR a 500-kW pool type reactor, a Co-60 high-dose rate irradiation facility, and a sub-critical assembly. Website: <http://reactor.osu.edu>

Laboratories:

Academic Center of Excellence (ACE) in Instrumentation, Control and Safety Structure

OSU Director: C. Smidts

OSU Co-Director: T. Aldemir

Website: <https://rrl.osu.edu/>

Nuclear Analysis and Radiation Sensor (NARS) Lab

OSU Director: R. Cao

Website: <https://mae.osu.edu/nars>

Reactor Therman Hydraulics Laboratory

OSU Director: T. Zhang

Website: <https://mae.osu.edu/rthl>

ONTARIO TECH UNIVERSITY

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Faculty of Engineering and Applied Science
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905.721.8668 ext. 5482
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Contact: Jennifer McKellar
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	7/24-6/25	7/25-6/26
B.S.	22	26
Masters	7	5
Ph.D.	5	4

Number of Graduates

Graduate Students Enrollment: 51 Masters/16 Ph.D.

Nuclear Science and Engineering Faculty

Kirk Atkinson, Associate Professor (905-721-8668 x5501) [kirk.atkinson@ontariotechu.ca] Ph.D. in Physics, King's College London, UK. An applied radiation physicist with experience in radiation science, reactor physics, radiation transport, shielding, detector physics, radiation imaging and computational methods.

Hossam A. Gaber, Professor of Energy and Nuclear Engineering (905-721-8668 x5497) [hossam.gaber@ontariotechu.ca] Ph.D., Okayama, P.Eng., Distinguished Lecturer IEEE NPSS, IET Fellow (FIET). Plasma-Based Waste Treatment, Nuclear-Renewable Hybrid Energy Systems, Hybrid Charging and Fueling Transportation Systems, Smart Energy & Interconnected Infrastructures, and Intelligent Safety and Control Systems.

Glenn Harvel, Professor of Nuclear Engineering (905-721-8668 x5508) [Glenn.Harvel@ontariotechu.ca] Ph.D., McMaster University. Small Nuclear Reactors, Nuclear plant ageing and design, decommissioning, multiphase flow, instrumentation for multiphase flow, neutron radiography.

Daniel Hoornweg, Associate Professor of Energy (905-721-8668 x5560) [daniel.hoornweg@ontariotechu.ca] Ph.D., University of Toronto. Energy and material flows of cities, urban systems, sustainability, smart cities, renewable energy, waste management, integrated energy and transportation systems.

Brian Ikeda, Associate Professor of Nuclear Engineering (905-721-8668 x5523) [Brian.Ikeda@ontariotechu.ca] Ph.D., University of Newcastle upon Tyne. Corrosion of materials in molten fluoride salts, electrochemical and physical behavior of fluorine generating anodes, corrosion of nuclear waste container materials, stress assisted corrosion cracking of metals, radioactive waste management, localized corrosion, elevated temperature corrosion.

Matthew Kaye, Associate Professor of Nuclear Engineering (905-721-8668 x5524) [Matthew.Kaye@ontariotechu.ca] Ph.D., Queen's University. Nuclear materials, high temperature materials chemistry, phase diagram development, nuclear fuel behavior, aqueous chemistry of nuclear materials and corrosion.

Lixuan Lu, Professor of Nuclear Engineering (905-721-8668 x5526) [Lixuan.Lu@ontariotechu.ca] Ph.D., University of Western Ontario. Nuclear power plant instrumentation and control, distributed control, network control systems, reliability and safety of I&C Systems, risk-informed decision making, nuclear based hydrogen generation.

Rachid Machrafi, Professor of Nuclear Science (905-721-8668 x5522) [rachid.machrafi@ontariotechu.ca] Ph.D., Joint Institute for Nuclear Research. Transmutation of nuclear waste, health physics and dosimetry, radiation detection technology, radiation techniques, space radiation, Monte Carlo modelling and education technology.

Jennifer McKellar, Associate Professor of Energy Engineering (905-721-8668 x5498) [jennifer.mckellar@ontariotechu.ca] Ph.D., University of Toronto. Techno-economic and environmental assessments of energy systems. Fossil fuel-, renewable- and nuclear-based energy systems. Options for improving the sustainability of energy systems. Tools in support of decision-making.

Eleodor Nichita, Associate Professor of Nuclear Engineering (905-721-8668 x5527) [Eleodor.Nichita@ontariotechu.ca] Ph.D., Georgia Institute of Technology. Neutronic design and analysis methods for advanced nuclear reactors, reactor kinetics and control, neutron and radiation transport, mathematical modeling and numerical analysis.

Igor Pioro, Professor of Nuclear Engineering (905-721-8668 x5528) [Igor.Pioro@ontariotechu.ca] Ph.D.; Dr. Tech. Sc.; P.Eng. (Ont.); Fellow ASME, CAE, CSME & EIC; Life-time member of ANS & member of CNS; Foreign Fellow of National Academy of Sciences of Ukraine; Founding Editor of the ASME Journal of Nuclear Engineering & Radiation Science. Thermalhydraulics of nuclear reactors, Generation-IV reactor concepts, Small Modular Reactors (SMRs), boiling, forced convection including supercritical pressures, two -phase thermosyphons, heat exchangers, and heat-recovery systems.

Akira Tokuhiro, Professor (905-721-8668 x3142) [akira.tokuhiro@ontariotechu.ca] Ph.D., Purdue University. Advanced nuclear reactor designs and safety issues, Small, Micro-Modular and Advanced Light Water Reactors, Climate change modeling and simulation (DICE), system-level complexity analytics, thermal-hydraulics, probabilistic, safety and accident analyses. Experimental and computational methods and data analyses, including VR/AR and AI/ML methods.

Edward Waller, Professor of Nuclear Engineering (905-721-8668 x5521) [Ed.Waller@ontariotechu.ca] Ph.D., Rensselaer Polytechnic Institute. Applied health physics, radiation detection, dosimetry, biological effects of radiation, risk analysis, non-intrusive investigation, threat detection and security.

Other Faculty

Filippo Genco, Associate Teaching Professor (905-721-8668 x5444) [Filippo.Genco@ontariotechu.ca] Ph.D. Purdue University, 2013. Plasma Material Interactions; Magnetic Fusion Applications; Radiation damage in materials; Advanced numerical methods; Renewable Energies and Alternative Technologies; Nuclear and electric propulsion; Direct energy conversion systems and applications; NanoFluids & Nanopatterning applications.

Sharman Perera, Director Nuclear Facilities, Manager Sub Critical Assembly, Associate Teaching Professor (905-721-8668 x5505) [sharman.perera@ontariotechu.ca]. Ph.D. Ontario Tech University. Nuclear Labs and Facility Design, Computational Fluid Dynamics, Environmental Effects of Radiation, Aerosol Mechanics, Monte Carlo Modeling and Simulation, Virtual Reality (VR) Simulation and Training for Nuclear Applications.

Marlene Ramphal, Nuclear Engineer in Residence (905-721-8668 x5495) [Marlene.Ramphal@ontariotechu.ca] B.Eng. University of Toronto, Electrical Engineering, nuclear plant operations, engineering, refurbishment, nuclear security, corporate functions and organizational effectiveness.

Anthony Waker, Professor Emeritus of Radiation Physics and Nuclear Science (905-721-8668 x5474) [Anthony.Waker@ontariotechu.ca] Ph.D. London South Bank University. Radiation detector development, experimental microdosimetry, neutron spectrometry, X-ray and beta particle impact on biological cellular systems.

Nuclear Science and Engineering Research Laboratories

SIMULATION LABORATORY

The simulation lab contains a state-of-the-art computer and display system for simulation of nuclear power plants, such as the Pickering and Darlington nuclear-electric generating units.

AEROSOL AND RADIATION RESEARCH LABORATORY

A state-of-the-art aerosol research laboratory is used to investigate potential hazards from terrorist use of radiological dispersal devices (RDDs). The research is widely applicable to determination of hazards from airborne radioactive contaminants. Dr. Ed Waller.

DETECTOR PHYSICS AND EXPERIMENTAL MICRODOSIMETRY LABORATORY

The radiation detector development and experimental microdosimetry laboratory is set up for the custom design, construction and testing of advanced gas ionization detectors such as tissue equivalent proportional counters, gas electron multipliers and other detection systems such as solid-state detectors and plastic scintillators for mixed-field radiation protection dosimetry and microdosimetry. Coupled with these detectors are the electronic and computer facilities necessary for the development of data acquisition systems and control software. Dr. Anthony Waker.

CORROSION AND ELECTROCHEMISTRY LABORATORY

The corrosion and Electrochemistry lab is set-up to investigate the electrochemical processes that drive corrosion at elevated temperatures. A particular emphasis is placed on the chemical and electrochemical processes associated with localized corrosion processes such as localized corrosion and stress assisted corrosion cracking. Special facilities are used to examine processes in molten salts that range from low melting point, but noxious fluoride salts to high temperature metal chloride salts. A variety of electrochemical methodologies are available to interrogate localized corrosion processes. Dr. Brian Ikeda.

NUCLEAR DESIGN LABORATORY

The primary mission of the Nuclear Design Laboratory is to study multi-disciplinary interfaces and integrated designs related to nuclear technology. The main focus is on the development of simpler designs, improved work processes, and improved decommissioning methods. Dr. Glenn Harvel.

HIGH PERFORMANCE COMPUTING AND VISUALIZATION LAB

The High Performance Computing and Visualization Lab is set up for the investigation of computationally and output intensive problems that appear in reactor and radiation physics. It supports research into parallel algorithms and into methods for displaying large amounts of data in a meaningful way using three-dimensional graphic representations. Dr. Eleodor Nichita.

NUCLEAR MATERIALS LABORATORY

The nuclear materials laboratory investigates and characterizes metals, alloys, and aqueous systems that are important in nuclear reactor systems and other energy production facilities. The lab houses an X-ray Diffractometer capable of characterizing samples at both room temperature and elevated temperatures. Custom-built vessels allow for exploration of aqueous systems up to 250 °C. The experimental work can provide fundamental thermochemical data that supports applied thermodynamic modelling work also performed in this laboratory. Dr. Matthew Kaye.

ADVANCED PLASMA ENGINEERING LABORATORY

Advanced Plasma Engineering Laboratory (APEL) specializes in high density and high energy plasma systems and technologies (microwave, radio frequency, and DC). The research has numerous applications in radioactive waste treatment, decommissioning, nuclear fusion, aerospace, waste-to-energy, oil and gas, and manufacturing. The APEL lab emphasizes on innovations in plasma generation, control, diagnostics, Multiphysics simulation, material analysis (using TGA-FTIR-GCMS), and experimentations, and their applications on multiple industrial disciplines. Dr. Hossam Gaber.

ENERGY SAFETY AND CONTROL LABORATORY

Energy Safety and Control Laboratory (ESCL) specializes in advanced safety and control systems and their applications in nuclear, energy, and plasma systems. Research includes probabilistic risk modeling, safety system design, real time safety verification, fault propagation modeling, recovery operation synthesis, and safety instrumented systems. The ESCL lab utilizes applied AI and Multiphysics simulation to design and implement safety and control systems with state-of-the-art instrumentation and experimental setup. Dr. Hossam Gaber.

CLASS II NUCLEAR IRRADIATION FACILITY

The irradiation facility consists of a Thermo-Fisher P385 D-D reaction neutron generator, a Hopewell Designs ISO Narrow Band Series X-Ray generator and a Hopewell Designs G10 Cs-137 gamma irradiator. All devices are enclosed in a large shielded, interlocked room and configured to be used individually or in tandem to produce mixed radiation fields. The facility is used for radiation detector characterization, neutron spectrometry, biological sample irradiations and undergraduate laboratory exercises. Dr. Kirk Atkinson, Dr. Anthony Waker.

OREGON STATE UNIVERSITY

School of Nuclear Science and Engineering

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	7/22-6/23	7/23-6/24	7/24-6/25
B.S.	32	32	26
Masters	34	55	49
Ph.D.	6	5	6

Number of Graduates

Graduate Student Enrollment: 182 Masters/ 38 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

Camille J. Palmer, School Head and Professor (541-737-2343) [camille.palmer@Oregonstate.edu] Ph.D., University of Cincinnati, 2003. International nuclear security and nonproliferation, concepts and approaches for nuclear safeguards implementation, and nuclear data and radiation transport for nuclear forensic signature development. Website: <https://engineering.oregonstate.edu/people/camille-palmer>

Samuel A. Briggs, Associate Professor (541-737-7838) [samuel.briggs@oregonstate.edu] Ph.D., University of Wisconsin-Madison, 2016. Materials development for next-generation nuclear reactors; microstructural characterization and microscopy of radiation damage in materials; materials degradation in liquid sodium and molten salt environments; combined effects of superimposed environmental stressors. Website: <https://engineering.oregonstate.edu/people/samuel-briggs>

Tianyi Chen, Assistant Professor (541-737-8190) [tianyi.chen@oregonstate.edu] Ph.D., Texas A&M University, 2015. Nuclear materials – Utilizing in-situ mechanical and thermophysical testing, as well as scaling analysis, to advance the mechanistic understanding of materials' performance in harsh environments, with the goal of accelerating the deployment of next-generation fission and fusion technologies. Research interests include fuel, structural and functional materials, radiation and environmental effects, microstructure – property – performance relationship, advance characterization, multiscale mechanical testing, and physics -based modeling. Website: <https://engineering.oregonstate.edu/people/tianyi-chen>

Alexander (Sasha) Chemey, Assistant Professor (541-737-7076) [alexander.chemey@oregonstate.edu] Ph.D., Florida State University, 2019. Nuclear science and technologies including focuses on the interface of nuclear chemistry, physics, and engineering, addressing generational challenges in power production, radioactive waste storage, and production of valuable isotopes. Website: <https://beav.es/alchemist>

Abi T. Farsoni, Associate Professor (541-737-9645) [abi.farsoni@oregonstate.edu] Ph.D., Oregon State University, 2006. Radiation Detectors; real-time digital electronics; FPGA design; digital pulse processor; nuclear medical imaging systems; radionuclide detection; nuclear weapon test monitoring; low-cost radiation spectroscopy; direction-sensitive detectors. Website: <https://research.engr.oregonstate.edu/rddg/home>

Izabela Gutowska, Associate Professor (541-737-7053) [izabela.gutowska@oregonstate.edu] Ph.D., Oregon State University, 2016. Nuclear reactor thermal hydraulics, with emphasis on the application of computational fluid dynamics. Experimental and computational thermal hydraulics aspects involving Generation IV and small modular reactors. Computational fluid dynamics verification, validation, and uncertainty analyses. Reactor safety and advanced reactors design. CFD-Enabled Digital Twinning. Website: <https://engineering.oregonstate.edu/people/izabela-gutowska>

Kathryn A. Higley, 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; risk communication. Certified Health Physicist. Fellow of the Health Physics Society, President National Council on Radiation Protection and Measurements. Website: <https://engineering.oregonstate.edu/people/kathryn-higley>

Trevor Kent Howard, Assistant Professor, (541-737-6152) [trevor.howard@oregonstate.edu] Ph.D., Oregon State University, 2018. Thermal Hydraulics, Experiment and Simulation Coupling (Hybrid Simulation, Digital Twins, Virtual-Sensing, and VVUQ for complex systems), Computational Multiphysics, Scaling. Website: <https://engineering.oregonstate.edu/people/trevor-howard>

Wade Marcum, Executive Associate Dean and 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: <https://engineering.oregonstate.edu/people/wade-marcum>

Madicken Munk, Assistant Professor (541-737-2343) [munkm@oregonstate.edu] Ph.D., University California, Berkeley, 2017. Radiation Transport, Reactor Physics, Hybrid Methods, Scientific Computing and Scientific Software. Website: <https://engineering.oregonstate.edu/people/madicken-munk>

Todd S. Palmer, University Distinguished Professor (541-737-6306) [todd.palmer@oregonstate.edu] Ph.D., Nuclear Engineering and Scientific Computing, University of Michigan, 1993. Deterministic, Monte Carlo and hybrid techniques for radiation transport; reactor physics; general numerical methods; nuclear criticality safety; radiation hydrodynamics; high performance computing; transport in stochastic mixtures. Website: <https://engineering.oregonstate.edu/people/todd-palmer>

Steven R. Reese, Associate Professor, Radiation Center Director, (541-737- 2344) [steve.reese@oregonstate.edu] Ph.D., Colorado State University, 1997. Regulatory Compliance; Reactor Dosimetry; Neutron Radiography; Neutron Depth Profiling; Prompt Gamma Neutron Activation Analysis. Certified Health Physicist.
Website: <https://engineering.oregonstate.edu/people/steven-reese>

Brian G. Woods, 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. Website: <https://engineering.oregonstate.edu/people/brian-woods>

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 design, fuel enrichment, system safety analysis code validation. Website: <https://engineering.oregonstate.edu/people/qiao-wu>

Haori Yang, Associate Professor (541 737-7057) [Haori.Yang@oregonstate.edu] Ph.D., University of Michigan at Ann Arbor, 2009. Non-destructive interrogation techniques; development of innovative radiation sensors; laser spectroscopy; general applications of nuclear engineering.
Website: <https://engineering.oregonstate.edu/people/haori-yang>

Other Faculty

David M. Hamby, Professor Emeritus [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: <https://engineering.oregonstate.edu/people/david-hamby>

Tim Kelly, Professor, Senior Research [tim.kelley@oregonstate.edu] Ph.D., Purdue University, 1976. Numerical methods for linear and nonlinear solvers, integral equations, particle transport, and optimization. Website: <https://engineering.oregonstate.edu/people/tim-kelley>

Andrew C. Klein, Professor Emeritus [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: <https://engineering.oregonstate.edu/people/andrew-klein>

Guillaume Mignot, Associate Professor Senior Research (541-737-6382) [guillaume.mignot@oregonstate.edu] Ph.D. University of Wisconsin-Madison, 2008. Study nuclear reactor severe accidents, development of advanced instrument and metering techniques for condensation film measurement, operational manager of the Naval Reactor Test Loop (NRTL).
Website: <https://engineering.oregonstate.edu/people/guillaume-mignot>

Alena Paulenova, Professor Emeritus [alena.paulenova@oregonstate.edu] Ph.D. Radiochemistry; chemistry of

fuel cycle; advanced separations methods for used fuel reprocessing and fuel waste forms; behavior of actinides and fission products; environmental and biomedical applications.

Website: <https://engineering.oregonstate.edu/people/alena-paulenova>

Anil K. Prinja, Professor, Senior Research [anil.prinja@oregonstate.edu] Ph.D., Queen Mary College, University of London, 1980. Moment-preserving reduced-order physics models for high energy charged particles; Markov-chain branching process theory of phase-space random particle populations; Generalized Master equation and closure models for radiation transport.

Website: <https://engineering.oregonstate.edu/people/anil-k-prinja>

Jose N. Reyes, Jr., Professor Emeritus [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. Website: <https://engineering.oregonstate.edu/people/jose-reyes-jr>

Ilham Variansyah, Assistant Professor, Senior Research (458-272-7295) [variansi@oregonstate.edu] Ph.D., University of Michigan, 2020. Computational radiation transport, nuclear reactor physics, general numerical and Monte Carlo methods, and high- performance computing.

Website: <https://engineering.oregonstate.edu/people/ilham-variensyah>

Aaron Weiss, Senior Faculty Research Assistant II (541-737-7084) [aaron.weiss@oregonstate.edu] M.S. Oregon State University, 2017. Thermal hydraulics experimental research, instrumentation development, manager of the Hydro-Mechanical Fuel Test Facility (HMFTF) and lab quality assurance and calibration programs. Website: <https://engineering.oregonstate.edu/people/aaron-weiss>

Nuclear Science and Engineering Research Center

OSU Radiation Center: The school's experimental programs are housed in the OSU Radiation Center. Research facilities include a 1.1 MW TRIGA Mark II nuclear reactor; the Energy Exploration Center; the Advanced Thermal-Hydraulic Research Laboratory (ATHRL) which includes the NuScale Integral Systems Test -2 Facility (NIST-2) facility; the Advanced Nuclear Systems Engineering Laboratory (ANSEL) which includes the High Temperature Test Facility (HTTF) and the Hydro- Mechanical Fuel Test Facility (HMFTF); the Advanced Nuclear Instrumentation Development Laboratory; the Nuclear Metallurgy Laboratory; the Sodium Test Facility; the Radioecology Research Laboratory; the Laser Imaging of Fluids and Thermal (LIFT) Facility, a Radiochemical Analytical Laboratory with radio-HPLC- and radio-LC-MS/MS systems; a Cobalt-60 Gamma Irradiator; Neutron Radiography facilities; Gamma and Alpha Spectrometry facilities; Radiological Instrument Calibration facilities; Liquid Scintillation Counting Systems; and Thermoluminescent Dosimetry Systems.

Computational research is supported through access to several school-specific multinode CPU servers and the College of Engineering High Performance Computing Cluster (HPC) - a heterogeneous mix of about 130 servers providing over 5500 CPU cores, over 250 GPUs, and over 50 TB total RAM. The Jen -Hsun Huang and Lori Mills Huang Collaborative Innovation Complex, coming online in 2026, will house one of the nation's most powerful supercomputers and will advance the application of AI to OSU's areas of strength.

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	7/24-6/25	7/25-6/26
B.S.		
Masters		
Ph.D.		

Number of Graduates

Graduate Student Enrollment: Masters/ Ph.D.

ABET Accreditation: BS

Distance Education Program

Offers Nuclear Engineering Courses and MEng Degree Online

<https://www.worldcampus.psu.edu/degrees-and-certificates/nuclear-engineering-masters/overview>

Nuclear Science and Engineering Faculty

Jon Schwantes, Acting Department Head and professor (814-863-8575) [Jon.Schwantes@psu.edu] Ph.D., Texas A&M University, 2002. Aqueous environmental radiochemistry, actinide chemistry, super-heavy element chemistry and physics, astrophysical nucleosynthesis, science-based stockpile stewardship, nuclear materials science, and nuclear forensics.

Jean Paul Allain, Professor [allain@psu.edu] Ph.D., University of Illinois at Urbana-Champaign, 2001. Engineering design for global social impact; ion-driven nanostructures on metals, semiconductors and polymers; advanced nanostructured bio interfaces for regenerative medicine; multi-scale computational surface physics; plasma-surface and materials interactions in fusion devices; in-situ surface characterization techniques; irradiation surface science. Currently on assignment to DOE Fusion Energy.

Fan-Bill Cheung, Professor of Mechanical and Nuclear Engineering (814-863-4261) [fxc4@psu.edu] Ph.D., University of Notre Dame, 1974. Director of Global Nuclear Power Safety Center; 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.

Jeffrey A. Geuther, Associate Director for Operations of the RSEC and Associate Research Professor of Nuclear Engineering (814-863-2745) [jag671@psu.edu] Ph.D., Rensselaer Polytechnic Institute, 2007. Nuclear reactor control systems; neutron activation analysis; radiation detection; radioisotope production; neutron beam experiments.

Miaomiao (Mia) Jin, Assistant Professor (814-863-6938) [mmjin@psu.edu] Ph.D., Massachusetts Institute of Technology, 2019. Computational materials science and engineering; Materials behavior in extreme environments; Development of radiation-tolerant structural materials; Defects and microstructure evolution in materials; Materials informatics.

Amanda Johnsen, Assistant Professor (814-865-6351) [amj15@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.

Hojong Kim, Associate Professor of Materials Science and Engineering and Nuclear Engineering (814-865-3117) [huk29@psu.edu] Ph.D., Massachusetts Institute of Technology, 2004. Electrochemistry; Pyroprocessing; Molten Salt Chemistry; Corrosion.

Saya Lee, Assistant Professor of Nuclear Engineering (814-865-0043) [sjl6054@psu.edu] Ph.D., Texas A&M University, 2014. Experimental Nuclear Thermal Hydraulics; Turbulent Flow Analysis; Flow in Porous Media; Boiling Heat Transfer; Non-Water-Coolant Experiment; Development of Thermal-Fluid Measurement Techniques.

Elia Merzari, Professor (814-863-7469) [ebm5351@psu.edu] Ph.D., Tokyo Institute of Technology, 2008. Nuclear thermal-hydraulics; Computational fluid dynamics; Supercomputing; Multiphysics simulations.

Arthur T. Motta, Professor and Graduate Program Chair of Nuclear Engineering (814-865-0036) [atm2@psu.edu] Ph.D., University of California- Berkeley, 1988. Materials behavior in the nuclear reactor environment, especially nuclear fuel cladding.

Dipanjana Pan, Professor and Graduate Program Chair of Nuclear Engineering (814-865-0036) [dfp5170@psu.edu] Ph.D., Indian Institute of Technology, 2002. Translational nanomedicine, nuclear medicine, imaging, and diagnostics.

Asok Ray, Distinguished Professor of Mechanical and Nuclear Engineering (814-865-6377) [axr2@psu.edu] Ph.D., Northeastern University. Instrumentation and control; Signal processing and identification; Robotics and automation; Nondestructive evaluation; Fatigue and fracture; Aerospace systems; Power systems.

Federico Scurti, Assistant Professor (814-867-1783) [fus191@psu.edu] North Carolina State University, 2019. Nuclear materials science for fusion and fission energy, novel sensor development.

Kenan Unlu, Director of Radiation Science and Engineering Center and Professor of Nuclear Engineering (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 Forensics and Nuclear Security Education and Research.

Stefano Terilizzi, Assistant Professor of Nuclear Engineering (814-863-6222) [sbt5572@psu.edu] Ph.D., Georgia Institute of Technology, 2020. Advanced reactor design, reactor physics, computational numerical methods development.

Xing Wang, Assistant Professor of Nuclear Engineering (814-863-0413) [xvw5285@psu.edu] Ph.D., University of Wisconsin-Madison, 2016. Radiation damage in materials; Materials in extreme environments; Development of structural materials for advanced reactors; Electron microscopy and atom probe tomography.

Douglas Wolfe, Metals, Ceramics and Coatings Processing Department Head for the Applied Research Laboratory, Professor of Materials Science and Engineering, and Engineering Science and Mechanics and Nuclear Engineering. (814-865-0316) (dew125@arl.psu.edu). Ph.D., The Pennsylvania State University, 2001. Structure-processing-property-performance relationships and the development of coatings and materials characterization.

Other Faculty

Martin de Jesus Nieto Perez, Associate Teaching Professor (814-865-3644) [mnieto@psu.edu] Ph.D., University of Illinois at Urbana-Champaign, 2004. Low and high temperature plasma interactions, neutronics and kinetic modeling/design relevant to the insertion of fusion-based neutron sources.

Massimiliano Rosa, Assistant Teaching Professor of Nuclear Engineering (814-865-4863) [mzr127@psu.edu] Ph.D., The Pennsylvania State University, 2007. Fundamentals of Nuclear Engineering; Nuclear Reactor Theory; Mathematics and Computation; Deterministic Transport Methods.

Jogender Singh, Professor of Materials Science and Engineering (814-863-9898) [jxs46@psu.edu] Ph.D., Banaras Hindu University, 1981. Powder sintering (metal, ceramic and composite) by Field Assisted Sintering Technology (FAST); design and development of heat sink components; coatings for extreme environments; materials characterization and evaluation.

Matthew Zerphy, Professor of Practice (814-863-6720) [mxz206@psu.edu] M.S.S.I, National Intelligence University, 2002. Nuclear Security Threat Analysis; Nuclear Security System Design.

Nuclear Science and Engineering Research Centers

Detector Development Laboratory (DDL): Established in 2017, DDL features a variety of detectors (including a muon detector and a large number of NaI detectors) as well as electronics and computational stations. The group performs both fundamental and applied radiation detection related research and provides graduate and undergraduate students with hands-on learning opportunities.

FUNNEL - FUSION Neutron Laboratory - A dual-tube D-T neutron-generation system is available in this laboratory: one tube with a neutron output of $1e8$ n/sec and the other tube with a neutron output of $1e10$ n/sec. The neutron-producing tubes have separate control units so they can be operated independently. The lower-neutron-output part of the system will provide a capability to accurately detect the alpha particles resulting from the D-T fusion reaction, thereby allowing for accurate measurements of neutron emission angles.

LEAF - Laboratory for Experiments to Advance Fission - A low-backscatter, stand-alone, off-campus, suppressed-room-return building houses a large-area, neutron/gamma-ray multi-detector system to significantly reduce the back-scatter effects that are relevant for time-correlated experiments. The experimental building has dimensions of 25' x 25' x 25' and is internally completely covered, including the floor and ceiling, by 1" of borated polyethylene to minimize the neutron return. Also, because the building is a pre-fabricated, stand-alone structure, only a minimal amount of concrete has been used to minimize the gamma-ray return. This unique laboratory is used for measurements of high-fidelity prompt and delayed gamma-ray/neutron data.

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 promotes research, education, and applications of radiation and nuclear science and engineering to students, faculty, and staff at Penn State, as well as to scientists in universities, governments, and industries worldwide. The RSEC facilities include the Penn State Breazeale Reactor (PSBR), gamma-ray irradiation facilities (in-pool irradiator and dry irradiator), the Neutron Beam Laboratory, the Hot Cell Laboratory, the Radionuclear Applications Laboratory, the Radiochemistry Teaching Laboratory, the Nuclear Security Nuclear Science & Engineering Education Sourcebook Page 103 Education Laboratory, the Subcritical Graphite Reactor Facility, and various radiation detection and measurement laboratories. The PSBR is a 1 MW, TRIGA reactor with moveable core in a large pool and with pulsing capabilities. A new core moderator assembly and five new beam ports including a cold neutron source were installed at the PSBR in the summer of 2018. An expanded neutron beam hall has recently been added to RSEC as a joint initiative with the Ken and Mary Alice Lindquist Department of Nuclear Engineering in order to accommodate the first and only Small Angle Neutron Scattering capability at a US University (expected to be operational January, 2025).

REACTR (Radioisotope Examination, Analysis, and Characterization, Techniques & Research) Lab. Housed within RSEC, includes ~1400 sqft of radiochemistry wet lab space, a radiation detection lab, actinide Mossbauer spectroscopy development, and a rad-dedicated, Time-Of-Flight Inductively Coupled Plasma Mass Spectrometer coupled with a Laser Ablation system for elemental mapping of nuclear materials.

**No revisions or updates have been submitted at this time*

POLYTECHNIQUE MONTRÉAL

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	7/21-6/22	7/22-6/23	7/23-6/24
Masters	2	5	2
Ph.D.	0	1	0

Number of Graduates

Graduate Student Enrollment: 8 Masters/ 5 Ph.D.

Nuclear Science and Engineering Faculty

Charles Bienvenue, Assistant Professor (514-340-4711 x 3620) [charles.bienvenue@polymtl.ca], Ph.D., Polytechnique Montréal, 2025. Reactor Physics; ionizing Radiation Physics; finite-element methods; modeling and simulation. Professional Engineer. [<https://www.polymtl.ca/expertises/en/bienvenue-charles>]

Cédric Béguin, Associate Professor (514-340-4711 x 3900) [cedric.beguin@polymtl.ca] Ph.D., Polytechnique Montréal, 2010. Fluid mechanics; multi-phase systems; modeling and simulations; energy; vibrations; hydraulics. Professional Engineer. [<https://www.polymtl.ca/expertises/en/beguin-cedric>]

Other Faculty

Alain Hébert, Adjunct Professor (514-340-4711 x 4519) [alain.hebert@polymtl.ca] Ph.D., Paris-XI, 1980. Reactor Physics; lattice code; neutron diffusion theory. Professional Engineer. [<https://www.polymtl.ca/expertises/en/hebert-alain>]

Guy Marleau, Adjunct Professor (514-340-4711 x 4204) [guy.marleau@polymtl.ca] Ph.D., McGill University, 1983. Reactor Physics. [<https://www.polymtl.ca/expertises/en/marleau-guy>]

Nuclear Science and Engineering Research Centers

SLOWPOKE Laboratory – Development of the method of neutron activation analysis for greater sensitivity, accuracy and ease of use. Application of neutron activation analysis for the chemical analysis of new materials, plastics, rocks, biological tissues and archaeological artefacts. Research collaborations in environmental sciences, medicine and archaeology. Production of radioactive tracers for research in chemistry (dynamics of fluidized bed reactors) and medicine (digestive system). Gamma -ray irradiation services for applications in medicine and telecommunications.

Research Staff

NAA Laboratory Director and SLOWPOKE-2 Reactor Manager: Darren Hall

Slowpoke Operator: Francis Ritchie Poirier

Slowpoke Technician (Physical Technology): Jacques Massicotte

Slowpoke Technician (Mechanical Manufacturing): José David Flor

Specialized Equipment

SLOWPOKE-2 nuclear reactor (20 KWth HALEU core)

Five high-purity germanium gamma-ray spectrometers

Automatic counting and irradiation system

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	7/246/25	7/256/26
B.S.	33	51
Masters	11	17
Ph.D.	8	11

Number of Graduates

Graduate Student Enrollment: 36 Masters / 28 Ph.D.

ABET Accreditation: B.S. (N.E.)

Nuclear Engineering Faculty

Seungjin Kim, Capt. James F. McCarthy, Jr. and Cheryl E. McCarthy Head of the School of Nuclear Engineering and Professor (765-494-5742) [seungjin@purdue.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; Thermal-hydraulics systems analysis code.

Hany S. Abdel-Khalik, Professor (765-496-9718) [abdelkhalik@purdue.edu] Ph.D., North Carolina State University, 2004. Validation and Uncertainty Quantification. Big Data Analytics and Data Assimilation. Cyberattack-resilient Control Systems. LWR Computational Reactor Physics.

Hitesh Bindra, Associate Professor and Undergraduate Chairman (765-496-2433) [hbindra@purdue.edu] Ph.D. University of Illinois, 2010. Thermal hydraulics, Advanced Reactors, Energy Storage, Statistical and Machine Learning. Website: <http://nuest-lab.com/>

Stylianios Chatzidakis, Assistant Professor, Associate Reactor Director and Director of Nuclear Engineering Radiation Laboratory (765-496-9698) [schatzid@purdue.edu] Ph.D., Purdue University, 2016. Artificial Intelligence and deep learning; functional sensors; remote sensing; muon tomography; nonproliferation; nuclear fuel cycle; advanced reactor monitoring.

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.

Allen Garner, Professor and Graduate Program Chairman (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.

Ahmed Hassanein, Paul L. Wattelet Distinguished Professor (765-496-9731) [hassanein@purdue.edu] Ph.D., University of Wisconsin, Madison, 1982. Plasma Material Interactions; Magnetic and Inertial Fusion Research; Computational Physics and Hydrodynamics; Extreme Ultraviolet Lithography; Laser and discharge produced plasma; Radiation and Particle Transport in Materials; Biomedical Engineering Applications.

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.

Xiaoyuan Lou, Associate Professor (765-496-2327) [lou49@purdue.edu] Ph.D.; Georgia Institute of Technology, 2010. Advanced manufacturing; Structural materials; High-temperature properties; Material degradation; Irradiation effects; Environmentally assisted cracking; Creep <https://web.ics.purdue.edu/~lou49/>

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; Hybrid Nuclear Systems; Hydrogen Generation - High Temperature Thermochemical Reactions; Hydrogen Storage. Website: <http://cobweb.ecn.purdue.edu/~shripad/>

Rusi Taleyarkhan, Professor of Nuclear Engineering (765-313-1876) [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.

Lefteri Tsoukalas, Professor (765-496-9696) [tsoukala@purdue.edu] Ph.D., University of Illinois, 1989. Neurofuzzy methodologies for complex power systems modeling, diagnostics and control; Intelligent instrumentation systems and sensors; Man-machine interface; Autonomous systems and robotics.

Yunlin Xu, Associate Professor (765-496-9033) [yulin@purdue.edu] Ph.D., Purdue University, 2004. Nuclear reactor simulation method study; Nuclear reactor simulation code development; Multi-physics coupling; Nuclear reactor safety analysis; Nuclear reactor design and optimization; Nuclear reactor fuel cycle study; Methods for solving large scale linear and nonlinear systems.

Other Faculty

Valeryi Sizyuk, Research 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 manufacturing.

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	7/24-6/25	7/25-6/26
B.S.	13	22
Masters	3	7
Ph.D.	1	6

Number of Graduates

Graduate Student Enrollment: 7 Masters / 18 Ph.D.

Nuclear Science and Engineering Faculty

Yaron Danon, Edward E. Hood Jr. Chair in Nuclear Engineering and Professor and serves as Director of the Nuclear Engineering Program and Director of the Gaerttner Linear Accelerator Center. (518 -276-4008) [danony@rpi.edu] Ph.D., Rensselaer Polytechnic Institute, 1993. Accelerator technology, neutron transport, adiation applications and Nuclear Data and instrumentation.
Website: <http://www.rpi.edu/~danony>

Hyun Gook Kang, Professor, William H. Hernstadt '57 Faculty Fellow in Nuclear Engineering, Chair, Nuclear Safety Review Board for RPI RCF (518-276-8251) [kangh6@rpi.edu] Ph.D., KAIST, 1999.
Digitalized System Risk; Dynamic and Static Probabilistic Risk Assessment; Emergency Operation Procedure; Safety System Design. Website: <https://faculty.rpi.edu/hyun-kang>

Wei Ji, Professor, William H. Hernstadt '57 Faculty Fellow in Nuclear Engineering; Director of Rensselaer Walthousen Reactor Critical Facility (518-276-6602) [jiw2@rpi.edu] Ph.D., University of Michigan, 2007.
Computational and Experimental Reactor Physics; Nuclear Energy System Design and Safety Analysis; Radiation Transport Theory and Computation; Multiscale and Multiphysics Computation; Heat and Mass Transfer Modeling for Multicomponent Multiphase Flow; Radiation Effects on Electronic Devices.
Website: <http://www.rpi.edu/~jiw2>

Jie Lian, Professor, William Weightman Walker Professor of Engineering (518-276-6081) [lianj@rpi.edu] Ph.D., University of Michigan, 2003. Nanoscale characterization and nanofabrication; Radiation damage and Radiation effects; Materials behavior under extreme environment; Advanced nuclear waste form and effective nuclear waste management; Nuclear Fuels; Validation of fuel modelling and simulation; Advanced Nuclear Fuel Cycles. Website: <https://faculty.rpi.edu/jie-lian>

Li (Emily) Liu, Professor, Department Head of Industrial and Systems Engineering (518-276-8592) [liue@rpi.edu] Ph.D., Massachusetts Institute of Technology, 2005. Condensed Matter Physics; Nuclear Materials; Neutron and X-ray Scattering and Methodology; Nuclear Thermal Data; Energy Policy; Community Engagement; Disaster Communications; Engineering Education.
Website: <https://faculty.rpi.edu/emily-liu>

Shanbin Shi, Associate Professor (518-276-8406) [shis3@rpi.edu] Ph.D., Purdue University, 2015. Thermal-hydraulics in advanced high-temperature nuclear reactors; Two-phase flow experiments and modeling research; Small modular reactor development; Reactor safety analysis.

Dominik Fritz, Assistant Professor (518-276-2489) [fritzd4@rpi.edu] Ph.D., Rensselaer Polytechnic Institute, 2022. Isotope Production for Medical and Industrial Application; Thermal Neutron Scattering; High Energy Photon Interactions; Medical Physics.
Website: <https://faculty.rpi.edu/dominik-fritz>

Other Faculty

Clinton Ballinger, Professor of Practice [ballic2@rpi.edu] Ph.D., University of Michigan, 1991. Nuclear reactor physics; Monte Carlo charged and neutral particle transport; Research translation and entrepreneurship; Optoelectronics, display, and energy conversion technologies. <https://faculty.rpi.edu/clint-ballinger>

Thomas C. Haley, Professor of Practice (518-276-6975) [haleyt2@rpi.edu] Ph.D., Rensselaer Polytechnic Institute, 2000. Engineering education, nuclear criticality safety, mathematical and statistical modeling, quality assurance.

James E. Olson, Sr. Lecturer (518-276-2389) [olsonj7@rpi.edu] D. Eng., Rensselaer Polytechnic Institute, 2022. Nuclear waste management; Subatomic Particle Behavior; Energy Technology Development; Engineering Education Psychology.

Michael Z. Podowski, Professor Emeritus (518-276-4000) [podowm@rpi.edu] Ph.D., Warsaw University of Technology, 1972. Reactor dynamics and safety; Applied mathematics; System stability; Two-phase flow and heat transfer. Website: <http://www.rpi.edu/~podowm>

Don Steiner, Professor Emeritus (518-276-4016) [profsteiner@nycap.rr.com] Ph.D., Massachusetts Institute of Technology, 1967. Fusion systems analysis; plasma engineering; blanket design and overall fusion reactor design.

Robert C. Block, Professor Emeritus [blockr@rpi.edu] Ph.D., Duke University, 1956. Nuclear structure and data; Accelerator technology; Neutron reactions; Industrial applications of radiation; Radiation effects in microelectronics; Nondestructive testing.

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

Bimal K Malaviya, Professor Emeritus [malavb@rpi.edu] Ph.D., Harvard University, 1964. Radioactive waste management; fission and fusion reactor physics and technology; biomedical applications; human factor engineering.

Nuclear Science and Engineering Research Centers

The Gaerttner Linear Accelerator (LINAC) Center has conducted continuous, active research for more than 64 years and is built around a multi-million-dollar, high-power, 60 MeV L-band traveling-wave electron accelerator. The accelerator produces short, intense pulses of neutrons and photons that enable a broad range of experimental capabilities. The center's primary mission is the generation of high-quality nuclear data for applications spanning the design of safe and reliable nuclear reactors, criticality analysis, and radiation-damage studies. It also supports research on the production of medical and industrial isotopes.

The NuScale Energy Exploration (E2) Center at RPI, established in March 2025, provides an innovative, hands-on environment for exploring nuclear science and engineering through immersive, simulated power plant operations. Leveraging advanced computer modeling, the center replicates the control room of a NuScale Small Modular Reactor (SMR) Plant. Participants take on the role of control room operators at a 12 -unit SMR plant, gaining firsthand experience with plant operations. The E2 Center enhances the undergraduate curriculum by incorporating interactive, simulator-based learning modules that support student engagement and understanding. It also contributes to workforce development by providing practical, industry-relevant training.

SOUTH CAROLINA STATE UNIVERSITY*

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	7/24/25	7/25/26
B.S.		
Masters		
Ph.D.		

Number of Graduates

Graduate Student Enrollment: Masters/ Ph.D.

ABET Accreditation: Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Science and Engineering Faculty

Musa B Danjaji, Professor, Department Chair, Academic Program Coordinator (803-516-4591) [mdanjaji@scsu.edu] Ph.D., University of Illinois, 1993. Nuclear Criticality; Nuclear Waste Management; Radiation Effects in Material; Alternative Energy Studies.

Joseph Boffie, Assistant Professor (803-536-7924) [jboffie@scsu.edu] Ph.D., University of Massachusetts, Lowell, 2019. Radiation science; Modeling and Simulation of Nuclear Reactor Systems; and Method Development (Neutron Transport Problems).

Kenneth C Okafor, Full time Adjunct Professor (803-516-4758) [kokafor@scsu.edu] Ph.D., The Ohio State University, 1988. Alternative Energy Studies; Nuclear Criticality.

**No revisions or updates have been submitted at this time*

TENNESSEE TECHNOLOGICAL UNIVERSITY

Nuclear Engineering Program

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(Enrollment started in the Fall 2024 semester.)

ABET Accreditation (planned): B.S. in Nuclear Engineering

Nuclear Science and Engineering Faculty

Jeffrey (Jeff) King, Founding Director and Professor (931-372-3721) [jking@tnitech.edu] Ph.D., Nuclear Engineering, University of New Mexico, 2006. Space nuclear technologies; nuclear reactor physics and design; computational methods; neutron imaging; nuclear materials.

Website: <https://www.tnitech.edu/directory/engineering/faculty/jeffrey-king.php>

Stephen Canfield, Professor, Department of Mechanical Engineering, (931-372-3254) [SCanfield@tnitech.edu] Ph.D., Mechanical Engineering, Virginia Tech, 1997. Mobile Robotics for inspection, maintenance, and repair in unstructured environments; under EPRI direction, developed remote inspection technologies for all DCSS canisters (vertical and horizontal) produced by ORANO, Holtec, NAC; developed and field -implemented robotic-based cold spray technologies for DCSS (SONGS) and storage cannisters at WRPS; under DOE direction, developed ORSS (Off-Riser Sampling System) robot for WRPS. Collaborations with Orano Federal Services/X Energy on developing robotic applications with small modular reactors.

Website: <https://www.tnitech.edu/directory/engineering/faculty/stephen-canfield.php>

David Dan, Assistant Professor, (931-372-6819) [ddan@tnitech.edu] Ph.D., Florida State University, 2019. Lanthanide and actinide separations; radiation detection and quantification; lanthanide/actinide coordination chemistry; f-element materials.

Bruce W. Jo, Associate Professor and Director of ADAMS (Advanced Dynamics, Aerodynamics, and Mechatronic Systems) Laboratory, (931-372-6403) [bjo@tnitech.edu] Ph.D., Mechanical Engineering, Columbia University, 2010. Aerodynamics; wind tunnel testing; electric ducted fans (EDFs), dynamics; control; mechatronics; digital twin.

Website: <https://www.tnitech.edu/directory/engineering/faculty/bruce-jo.php>

Mohan D. Rao, Professor and Chair of Mechanical Engineering (Acoustics, Vibrations, Damping and Design) Vibration and Acoustic Laboratory, (931-372-3270) [mrao@tnitech.edu] Ph.D., Mechanical Engineering, Auburn University, 1988. Website: <https://www.tnitech.edu/directory/engineering/faculty/mohan-rao.php>

Peng Zhang, Assistant Professor, (931-372-3323) [pzhang@tntech.edu]. Ph.D., Engineering Mechanics, Virginia Tech, 2016. Smart sensors and actuators; optimal control of shape morphing systems; mechanics of animal swimming and flying; aerodynamics of plants.

Website: <https://www.tntech.edu/directory/engineering/faculty/peng-zhang.php>

Nuclear Science and Engineering Research Centers and Laboratories

Nuclear Energy Technology Laboratory – Provides hands-on experience with a variety of introductory nuclear energy topics, including radiation detection and measurement, shielding, radiation physics, radiation protection, and radiation interactions with matter.

Space Nuclear Technology Laboratory – Dedicated to the study of technologies and materials to support the deployment of nuclear technologies in space. Current areas of study include metal hydrides for high temperature moderators, heat pipedesign and implementation, and advanced power conversion techniques.

Other Research Centers and Laboratories

ADAMS (Advanced Dynamics, Aerospace, and Mechatronic Systems) Laboratory – Student-based research laboratory to support various research and development activities, including CFD, wind tunnel testing, Stewart platform, UAVs, morphing structures, 3D printing, robotics manipulators, sensors, and highly interactive HRI (human-robot interaction) robot with ChatGPT and ML features enabled.

Polymer Processing Laboratory – Current areas of study include separations/extraction and recrystallization using patented massively arrayed microfluidic vessel, water purification and fouling of reverse osmosis membranes, materials development for both active and passive functions of remote sensors including nanoparticle sensors fluorescing in IR.

TEXAS A&M UNIVERSITY

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	7/24 6/25	7/25 6/26
B.S.	70	96
Masters	17	25
Ph.D.	9	14

Number of Graduates

Graduate Student Enrollment: 61 Masters/ 97 Ph.D.

ABET Accreditation: Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Engineering Faculty

Ayman I. Hawari, Department Head, Sallie and Don Davis '61 Professor, and Director, LEIP and FCML; Fellow ANS & AAAS (979-862-2636) [aihawari@tamu.edu], Ph.D. University of Michigan-Ann Arbor, 1995. Advanced nuclear reactors, research reactors, thermal neutron scattering data, radiation detection, and fuel performance and testing.

Karim E. Ahmed, Associate Professor and Director, MC²-E (979-847-6192) [karim.ahmed@tamu.edu], Ph.D., Purdue University, 2015. Multiscale modeling and simulations of materials, irradiation effects, and co - evolution of microstructure and properties of materials.

Carlo Fiorina, Associate Professor and Director, MEDAL (979-458-8165) [carlo.fiorina@tamu.edu], Ph.D., Advanced reactors, modeling and simulation, and fusion energy.
John Ford, Associate Professor (979-845-6271) [ford@tamu.edu] Ph.D., University of Tennessee at Knoxville, 1992. Health physics, radiation biology, and medical physics.

Yassin A. Hassan, Professor of Nuclear and Mechanical Engineering, L.F. Peterson '36 Chair II Professor, University Distinguished Professor, Regents Professor, and Director, CASMR & THR Lab; Fellow ANS, AAAS & ASME; Member, National Academy of Engineering (979-218-4417) [y-hassan@tamu.edu], Ph.D., University of Illinois, 1980. Nuclear power engineering, thermal hydraulics, and computational fluid dynamics. Professional Engineer.

Lingfeng He, Professor and Associate Director, FCML [lfhe@tamu.edu] Ph.D., Chinese Academy of Sciences, 2009. Materials behavior in extreme environments; environmental degradation of materials in nuclear power systems; microstructure, mechanical/thermal properties, and structural integrity/durability of materials and components.

Mark Kimber, Associate Professor, Director, Undergraduate Program and Director, Thermal Hydraulics Verification & Validation Laboratory (979-458-3952) [mark.kimber@tamu.edu], Ph.D., Purdue University, 2008. Experimental and computational thermal hydraulics, uncertainty quantification in isothermal and non-isothermal turbulent flows and two-phase heat transport.

Karen Vierow Kirkland, Professor and Director, Nuclear Heat Transfer Systems Lab; Fellow, ANS (979-458-0600) [vierow@tamu.edu], Ph.D., University of Tokyo, 1999. Nuclear power engineering, thermal hydraulics, and reactor safety.

Cable Kurwitz, Instructional Professor and Director, Interphase Transport Phenomena Laboratory (979- 845-6126) [kurwitz@tamu.edu], Ph.D., Texas A&M University, 2009. Nuclear power engineering, space power, and thermal hydraulics. Professional Engineer.

Yang Liu, Assistant Professor and Director, SMART (979) 458-8162 [y-liu@tamu.edu]; Ph.D., North Carolina State University, 2018. Efficient multiscale/multiphysics modeling and simulation (M&S) and uncertainty quantification for reactor systems, analysis and learning of heterogeneous data from experimentation and simulation to support engineering decision-making, and intelligent control and operation of advanced nuclear systems.

Craig Marianno, Associate Professor, Deputy Director, NSSPI and Director, Radiation Detection Measurement Lab; Fellow, HPS (979-845 -6093) [marianno@tamu.edu], Ph.D., Oregon State University, 2000. Nuclear security and nonproliferation, health physics, radioecology, radiation detection system development, and emergency response and consequence management.

Jim E. Morel, Professor, Nancy & Ron Stinson '53 Professor, Director, CLASS, and Co-Director, JCRNS; Fellow, ANS (979-845-6072) [morel@tamu.edu], Ph.D., University of New Mexico, 1979. Computational methods development for radiation transport, radiation-hydrodynamics, uncertainty quantification and reduced-order methods.

Farheen Naqvi, Assistant Instructional Professor (979-458-2477) [fnaqvi@tamu.edu], Ph.D., Nuclear physics, engineering, radiation detection, and nuclear security and nonproliferation.

Michael A. Nastasi, Professor; Fellow, ANS, APS & AAAS (979- 862-2636) [mikenastasi@tamu.edu], Ph.D., Cornell University, 1986. Materials for extreme nuclear environments, irradiation induced phase transformations, ion irradiation and plasma modification materials, synthesis and properties of high strength nanolayered composites.

Jean Ragusa, Professor and Associate Director, CLASS (979-862-2033) [jean.ragusa@tamu.edu], Fellow, ANS, Ph.D., Institut National Polytechnique de Grenoble, France, 2001. Computational methods for radiation transport and multiphysics applications, reactor analysis and design, Uncertainty quantification and data science applied to nuclear engineering. Website: <http://multiphysics.engr.tamu.edu>

Lin Shao, Professor, Associate Dean for Research, Robert Cochran University Professor, Regents Professor, and Director, Accelerator Laboratory; Fellow, ANS (979-845-4107) [lshao@tamu.edu], Ph.D., University of Houston, 2001. Nuclear materials and fuel cycles.

Pavel V. Tsvetkov, Professor, Director, Graduate Program, Slaughter Family Engineering Excellence Professor, and Director, AESL & SimLab (979-845-7078) [tsvetkov@tamu.edu], Ph.D., Texas A&M University, 2002. Design and demonstration of advanced nuclear systems, waste minimization, optimization, systems engineering, data science, artificial intelligence, energy sustainability and environment, direct energy conversion, autonomous control, novel instrumentation, nuclear security and nonproliferation, and cybersecurity.

Galina Tsvetkova, Senior Lecturer (979-845-4162) [tsvetkovag@tamu.edu], Ph.D., Texas A&M University, 2003.

Richard M. Waer, Professor of Practice (979-845-4161) [rwaer@tamu.edu], B.S., University of Arizona, 1989.

Mansung Yim, Professor, Director, NSSPI, and Director, ANS3 (979-862-2616) [msyim@tamu.edu], Sc.D., Harvard University, 1994. Nuclear nonproliferation, innovative nuclear systems, nuclear energy policy, and nuclear waste management.

Emeritus Faculty

Marvin L. Adams, Professor Emeritus, Ph.D., University of Michigan, 1986.

Leslie A. Braby, Senior Lecturer Emeritus; [labraby@tamu.edu] Ph.D., Oregon State University, 1972.

William H. Marlow, Professor Emeritus [w-marlow@tamu.edu] Ph.D., University of Texas at Austin, 1973.

Theodore Parish, Professor Emeritus, Ph.D. University of Texas, 1973.

Kenneth L. Peddicord, Professor Emeritus, Ph.D., University of Illinois, 1972.

Research Centers

Center for Advanced Small Modular and Microreactors (CASMR): Dr. Yassin Hassan, Director. CASMR is dedicated to developing and proving technologies that deliver affordable, reliable, resilient, secure, flexible, and sustainable energy with unparalleled safety and zero-carbon emissions. By accelerating the development of new and transformative technologies, materials, and methods to make nuclear fission more affordable, CASMR aims to enable its rapid and secure deployment.

Fostering a community of innovators, CASMR brings together the best and brightest ideas in research to create practical solutions that advance various industrial sectors, including space, manufacturing, emergency response, and defense. <https://casmr.tamu.edu/>

Center for Large-scale Scientific Simulations (CLASS): Dr. Jim Morel, Director and Dr. Jean Ragusa, Associate Director. CLASS' objectives are to perform multidisciplinary computational research across Department and College boundaries, and to prepare students for a career in high performance computing and computational science and engineering. CLASS has exceptional and unique expertise in computational methods for radiation transport calculations and is developing an open-source Sn radiation transport code, OpenSn, that is gaining a high degree of visibility within the nuclear engineering community. <https://class.tamu.edu/>

Center for Nuclear Security Science and Policy Initiatives (NSSPI): Dr. Mansung Yim, Director. The mission of NSSPI is to conduct innovative research on nuclear security and nonproliferation, including multidisciplinary R&D on safeguards, detection systems, nuclear forensics, proliferation risk, 3S integration, and emergency response, bridging the gap between policy and technology; educate the next generation of leaders in the field of nuclear security sciences; and to assist nuclear newcomer countries in transparent nuclear capability development. <https://nsspi.tamu.edu/>

Joint Center for Resilient National Security (JCRNS), Dr. Jim Morel, TAMUS Co-Director. JCRNS is a joint center of the Texas A&M University System and Los Alamos National Laboratory. The interim LANL Co-Director is Dr. John Scott. The mission of JCRNS is to develop and enhance national security capabilities between U.S. Department of Energy laboratories and U.S. universities supporting Los Alamos National Laboratory. The JCRNS will accomplish its mission through a series of programs that will develop over time. <https://nuclearsecurityoffice.tamus.edu/jcrns/>

Nuclear Engineering and Science Center (NESC): Jere Jenkins, Director. The NESC is a multi-division center comprising reactor facilities, research laboratories, and the Nuclear Power Institute (NPI). The center contains two research reactors. The first is a 1 MW TRIGA reactor with multiple irradiation options that is used for student training, research, and isotope production. The second is a 5 W AGN-201M reactor that is useful for student training and low-power research activities. The NESC also has multiple research laboratories with hot cells, gloveboxes, materials processing equipment, and radiochemistry capabilities. <https://nesc.tamu.edu/>

Department Labs and Facilities

Accelerator Laboratory: Dr. Lin Shao, Director. The accelerator laboratory was established to advance fundamental materials science research and develop ion beam techniques, with capabilities that include irradiation testing, ion doping, surface engineering, and ion beam analysis across materials ranging from semiconductor devices to nuclear systems. It supports externally funded core research while also serving as a collaborative platform and service center, with approximately half of its operational time dedicated to projects for national laboratories, universities, and industry partners.

The laboratory is widely recognized for its pioneering contributions to materials research, high -quality execution of customized projects, and the development of testing protocols that have become best practices in the field. It also plays a significant educational role, engaging students and educators from high school through graduate levels. <https://accelerator.engr.tamu.edu/lin-shao/>

Advanced Energy Systems Laboratory (AESL): Dr. Pavel Tsvetkov. AESL focuses on advancing deployable nuclear technologies by streamlining licensing processes and reducing development timelines to accelerate deployment. It enhances safety and security through real-time monitoring capabilities, while supporting sustainable energy solutions aligned with near-zero waste goals.

Through strong industry collaborations, the lab drives practical, implementable innovations and plays a key role in workforce development by training the next generation of nuclear engineers.

<https://aesl.engr.tamu.edu/>

Advanced Nuclear Systems, Safety & Sustainability Laboratory (ANS3): Dr. Mansung Yim. The lab focuses on developing advanced modeling and simulation tools, along with a design support framework for advanced nuclear systems that integrates safety, security, and safeguards (3S) to improve system economics and public acceptance. Its work includes modeling and simulation of molten salt reactors and nuclear fuel cycles, safeguards design for fuel cycle facilities, analysis of integrated energy systems, and studies on enhancing public acceptance through mental model approaches. The lab is committed to advancing solutions that support the safe, sustainable, and responsible use of nuclear energy.

Fuel Cycle and Materials Laboratory (FCML): Dr. Ayman Hawari. The FCML has been dedicated to research to advance the nuclear fuel cycle and materials used in the industry since 2006. The laboratory is capable of both synthesizing nuclear materials and characterizing them afterwards. This includes radioactive and beryllium compounds with the safety programs and infrastructure in place. The facility provides unique opportunities for hands-on research important to the nuclear field. <https://fcml.html>

LEIP Laboratories – The Thermal Scattering Law Project: Dr. Ayman Hawari. Harnessing modern methods for material modelling and high-fidelity thermal scattering evaluations, the Scattering Law Project provides access to nuclear thermal scattering data from fundamental inputs to benchmark testing on key reactor and nuclear criticality materials to inspire and support the next generation of nuclear reactors.

<https://tslpdf.engr.tamu.edu/>

The Materials Under Challenging Conditions for Energy Applications (MC²=E Computational Lab): Dr. Karim Ahmed. The MC²=E Lab focuses on developing multiscale and multiphysics models, reduced-order models, and AI/ML tools to better understand and engineer nuclear and energy materials. Its work spans modeling materials in extreme environments, creating AI/ML-driven reduced-order models to predict materials properties and performance, and advancing materials for next-generation energy systems, including nuclear fuels, cladding and structural materials for advanced reactors, fusion energy materials, and battery technologies.

Modeling, Engineering, Design and Analysis Laboratory (MEDAL): Dr. Carlo Fiorina. MEDAL's mission is to advance nuclear technology for both fission and fusion energy systems through pioneering research. We develop numerical methods and algorithms for compressible and incompressible flows, neutron diffusion and transport, and nonlinear solid mechanics, while producing high-quality scientific computing software. Our work integrates traditional approaches with scientific machine learning and model order reduction when beneficial and incorporates advanced uncertainty quantification and data assimilation techniques for complex nonlinear systems. We also focus on the design and analysis of nuclear energy systems, components, and experiments, and are strong advocates for open-source software development, emphasizing best practices for creating high-quality, sustainable tools. <https://medal.engr.tamu.edu/>

Nuclear Heat Transfer Systems Laboratory: Dr. Karen Kirkland. The Nuclear Heat Transfer Systems Laboratory was established to investigate condensation heat transfer mechanisms, evaluate new reactor designs and safety systems, and advance reactor safety analysis. Supported by the U.S. Department of Energy, Japanese nuclear utilities, the U.S. Nuclear Regulatory Commission, and Sandia National Laboratories, the lab has enabled graduate research on passive heat removal systems in advanced light-water reactors and uncertainty quantification for Gen IV reactor modeling. These efforts have led to the development of thermal-hydraulic test facilities, new theoretical models for condensation heat removal in the presence of non-condensable gases, and advancements in severe accident analysis methodologies. The lab is equipped with a 150-kW steam supply, high-speed imaging, extensive instrumentation, and a state-of-the-art data acquisition system, and is now expanding into analysis methods for high-temperature gas-cooled reactors, probabilistic risk-informed best estimate modeling, and detection technologies for special nuclear materials. <https://nuclear-heat-transfer-systems.html>

Nuclear Reactor Simulation Laboratory (SimLab): Dr. Pavel Tsvetkov. The SimLab supports both academic instruction and research in reactor and power plant dynamics, operations, instrumentation and control, human-machine interfaces, and cyberphysical security. The lab houses a full-scope GPWR training simulator, widely used across industry and academia, along with numerous part-scope and engineering-level simulators that model plant behavior and generate data for research. Enhanced with modern computing, advanced 3D graphics, and virtual/augmented reality, SimLab also supports digital twin development and security applications, with simulation coverage spanning most nuclear power plants in the U.S., France, and globally.

Radiation Detection Measurement Laboratory: Dr. Craig Marianno. In this laboratory, students investigate both commercially available detection systems and custom systems developed in-house. They conduct research to develop best practices, mission-specific detection techniques and failure modes. These systems are used in emergency responses, counter terrorism, safeguards, nuclear security and operational health physics.

Scientific Machine Learning for Advanced Reactor Technologies (SMART) Laboratory: Dr. Yang Liu. At the SMART Lab, our mission is to advance nuclear engineering by integrating state-of-the-art machine learning with modeling and simulation. Our work focuses on three core areas: developing physics-informed machine learning within the MOOSE framework to enable accurate and efficient reactor modeling with uncertainty quantification and data assimilation; building an AI-enhanced, digital twin-integrated cyber-physical thermal-fluid testbed for real-time monitoring, autonomous control, and scalable, remote experimentation; and exploring generative AI, including large language models, for applications such as real-time system monitoring and AI-assisted operation of complex nuclear tools. Through these efforts, we aim to deliver robust, data-driven solutions to complex nuclear engineering challenges. <https://smart.engr.tamu.edu/>

Thermal-Hydraulic Research Laboratory (THR Lab): Dr. Yassin Hassan. The mission of the laboratory is to investigate the complex, multiphase flow of multiscale, multi-physics flow phenomena using non-intrusive global field measurement techniques. The laboratory provides the ability to use state-of-the-art particle image velocimetry techniques to study these flows. The laboratory is equipped with fast-pulsed, high-energy lasers and fast high-resolution cameras. Data are analyzed using in-house developed tracking, imaging and pattern recognition routines. The combination of instantaneous measurements of full-fields of velocity and laser-induced temperature measurements enables a multitude of interesting studies of single and multiphase flows. <https://thrlab.tamu.edu/>

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	7/24-6/25	7/25-6/26
B.S.	22	29
Masters	19	20
Ph.D.	9	13

Number of Graduates

Graduate Student Enrollment: 19 Masters/ 74 Ph.D.
ABET Accreditation: Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Engineering Faculty

Massimiliano Fratoni, Department Chair and Xenel Distinguished Professor [maxfratoni@berkeley.edu] Ph.D., University of California, Berkeley, 2008. Advanced reactor design; computational methods; and nuclear fuel cycle. Current projects focus on pebble bed reactors, molten salt reactors, space electric and thermal propulsion; and fuel cycle.
Website: [http:// www.nuc.berkeley.edu/people/massimiliano-fratoni](http://www.nuc.berkeley.edu/people/massimiliano-fratoni)

Rebecca Abergel, Professor [abergel@berkeley.edu] Ph.D., University of California, Berkeley, 2006. Heavy element and actinide science. Nuclear fuel cycle chemistry, waste management, and radiochemical separations. Radionuclide toxicology, medical countermeasures, and nuclear/radiological preparedness. Radiopharmaceuticals and targeted radionuclide therapy. Radioanalytical, spectroscopic, and imaging methods for nuclear safeguards.
Website: <https://nuc.berkeley.edu/people/rebecca-abergel/>

Lee Bernstein, Professor (510-642-4077) [labernstein@berkeley.edu] Ph.D., Rutgers University, 1994. Medical radionuclide production. Statistical properties of nuclear matter; Nuclear physics in high energy density plasmas; Neutron- induced reaction cross section measurements. Website: [http:// nucleardata.berkeley.edu/](http://nucleardata.berkeley.edu/)

Bethany L. Goldblum, Associate Professor and Head Graduate Advisor [bethany@nuc.berkeley.edu] Ph.D., University of California, Berkeley, 2007. Fundamental and applied nuclear physics, proliferation detection, and nuclear weapons policy. Executive Director, Nuclear Science & Security Consortium (NSSC), Founder and Director, Nuclear Policy Working Group (NPWG), Group Leader, Bay Area Neutron Group (BANG). Website: <http://appliedphysics.nuc.berkeley.edu>

Peter Hosemann, Professor (510-717-5752) [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: <https://materials.nuc.berkeley.edu/>

Igor Jovanovic, Professor, (510-664-5833) [ijov@berkeley.edu] Ph.D., Nuclear Engineering, University of California, Berkeley, 2001. Radiation detection and measurement for nuclear security, nuclear energy, and nuclear and particle physics. Nuclear nonproliferation and nuclear forensics. Intense laser science and technology, laser-matter interactions, and fusion technology. Website: <https://nuc.berkeley.edu/people/igor-jovanovic/>

Per F. Peterson, Professor, William and Jean McCallum Floyd Endowed Chair (510-643-7749) [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>

Raluca O. Scarlat, Associate Professor and Vice Chair for Undergraduate Matters [scarlat@berkeley.edu] Ph.D., Nuclear Engineering, University of California, Berkeley, 2012. Chemical and thermophysical characterization of high-temperature molten salts and other inorganic fluids, and heat and mass transport pertaining to energy systems. Electrochemistry, corrosion, thermodynamics. Nuclear reactor safety analysis, licensing and design, and engineering ethics. Website: <https://salt.nuc.berkeley.edu/>

Daniel Siefman, Assistant Professor [daniel.siefman@berkeley.edu] Ph.D., Nuclear Engineering, École polytechnique fédérale de Lausanne, 2019. Critical and subcritical experiments and methods; nuclear data validation and adjustment; computational methods in radiation transport; neutron noise; reactor dosimetry; design optimization and safety analysis of reactors with machine learning. Website: <https://nuc.berkeley.edu/people/daniel-siefman/>

Guanyu Su, Assistant Professor and Master of Engineering Faculty Lead [gysu@berkeley.edu] Ph.D., Nuclear Science and Engineering, MIT, 2018. Heat and mass transfer in fission and fusion reactors; high temperature thermal energy storage for advanced energy systems; AI and machine learning enabled technologies for advanced nuclear energy platforms. Website: <https://heat.nuc.berkeley.edu/>

Eleanor Tubman, Assistant Professor [e.r.tubman@berkeley.edu] Ph.D., University of York, 2016. Generation of magnetic fields within fusion conditions; production of collisionless shock waves; methods to measure electromagnetic fields; charged particle detectors; laser instabilities; laboratory astrophysics; pulsed power. Website: <https://nuc.berkeley.edu/people/ellie-tubman/>

Karl A. van Bibber, Shankar Sastry Chair for Leadership and Innovation & Professor and Shankar Sastry Chair for Leadership and Innovation (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: <http://www.nuc.berkeley.edu/people/karl-van-bibber>

Other Faculty

Eric B. Norman, Professor of the Graduate School (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 ^{130}Te ; 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>

Carl Schroeder, Adjunct Professor (510-486-4723) [cbschroeder@berkeley.edu] Ph.D., University of California, Berkeley, 1999. Interests include intense laser-plasma and beam-plasma interactions, plasma-based accelerators, advanced acceleration concepts, novel radiation sources, free-electron lasers, and related topics. Website: <https://nuc.berkeley.edu/people/carl-schroeder/>

Youngho Seo, Professor in Residence (415-353-9464) [yseo@berkeley.edu] Ph.D., University of California, Los Angeles, 2002. Primary research focus is to use quantitative SPECT/CT, PET/CT, and PET/MR molecular imaging tools for a broad range of research areas from small animal imaging using dedicated animal imaging systems and basic instrumentation development to physics analysis of clinical research data. Website: <https://prl.ucsf.edu> & <https://nuc.berkeley.edu/people/youngho-seo/>

Kai Vetter, Professor of the Graduate School (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 to biomedical imaging; search for neutrino-less double-beta decay in ^{76}Ge 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>

Jasmina L. Vujic, Professor of the Graduate School (510-643-8085) [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 Mult assembly 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>

Nuclear Engineering Research Centers

Nuclear Science and Security Consortium (NSSC): The NSSC is a consortium of nine major research universities and six DOE national laboratories, of which UC Berkeley is the lead institution. Established by the DOE National Nuclear Security Administration's Office of Defense Nuclear Nonproliferation R&D in 2011 and recently extended for a \$25M, five-year term in 2026, the purpose of the NSSC is to develop the next generation of nuclear scientists and engineers and transition them into careers in the national laboratories and other government agencies. Primarily the Consortium supports graduate student fellowships, connecting this talent with participating DOE labs to perform research advancing the state-of-the-art in nuclear security science. The NSSC supports research across the entire spectrum of relevant disciplines, including nuclear physics and nuclear data, radiation detection and nuclear instrumentation, nuclear chemical engineering and radiochemistry, nuclear materials science, nuclear engineering, and computing and optimization for nuclear applications.

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.

Detection Laboratory: Kelp Watch (<http://kelpwatch.berkeley.edu/>) and Rad Watch. Additional Research Areas: Computational Methods, Nonproliferation, Risk, Safety, and Large-Scale Systems Analysis, Ethics and the Impact of Technology on Society, Energy Systems and the Environment, Bio nuclear and Radiological Physics, Laser, Particle Beam, and Plasma Technologies Plasma and Fusion Science and Technology

Nuclear Materials Laboratory: This lab uses thermogravimetric techniques with microbalances to investigate the hydrating 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 material 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.

Nuclear Science User Facility Partner Institution: UCB-NE's department is a NSUF partner facility providing facilities to the NE community as a whole. SEM/FIB/EBSD/EDS for active and non-active samples is available as well as nanoindentation, (insitu and ex-situ) as well as Helium Ion Beam Microscopy, cryo and heating capability, macroscale tensile testing on active and non-active samples as well as heat treatments and sample preparation. All facilities are available through the NSUF user facility access process.

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 incompressible 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.

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	7/24-6/25	7/25-6/26
B.S.	22	16
Masters	10	8
Ph.D.	3	2

Number of Graduates

Graduate Student Enrollment: 8 Masters/ 26 Ph.D.
ABET Accreditation: Nuclear Engineering (BS)
SACSCOC Accreditation: Nuclear Engineering (MS and PhD)

Nuclear Science and Engineering Faculty

Michael Tonks, Department Chair, Professor, Alumni Professor of Materials Science & Engineering (352-846-3779) [michael.tonks@ufl.edu] Ph.D., University of Illinois, Urbana- Champaign, 2008. Computational nuclear materials, reactor fuel performance, computational materials science, computational mechanics. Website: <http://tonks.mse.ufl.edu/>

Assel Aitkaliyeva, Associate Professor (352-846-3778) [aitkaliyeva@mse.ufl.edu] Ph.D., Texas A&M, 2012. nuclear materials; thermal and mechanical properties; radiation damage; radiation effects. Website: <http://manatee.mse.ufl.edu>

James Baciak, Professor (352-273-2131) [jebaciak@mse.ufl.edu] Ph.D., University of Michigan, 2004. Radiation measurements; radiation detector development; new radiation detector materials; detector testing and characterization for gamma-ray spectroscopy; environmental monitoring; non-proliferation and treaty verification; nuclear security. Website: <http://mse.ufl.edu/people/name/james-baciak/>

Andreas Enqvist, Associate Professor (352-294-2177) [enqvist@mse.ufl.edu] Ph.D., Chalmers University of Technology, Sweden, 2010. Nuclear safeguards; detection statistics of radiation from fissile materials and the physics behind particle-detector interactions; neutron physics & detectors; neutron noise signals; radiation signal analysis, Data Fusion and Machine Learning. Website: <http://enqvist.mse.ufl.edu>

Ira Harkness, Instructional Assistant Professor (352-846-3329) [ira@mse.ufl.edu] Ph.D., University of Florida, 2018. Monte Carlo methods; neutron transport; nuclear safeguards; nonproliferation; engineering education.

Kyle Hartig, Associate Professor (202-270-4721) [hartig@mse.ufl.edu] Ph.D., Pennsylvania State University. Remote Sensing, Nuclear Nonproliferation/counterproliferation, Nuclear Security, and Nuclear Policy.

Jyothier Kumar Nimmagadda, Research Assistant Scientist (352-294-2102) [jyothir@ufl.edu] Ph.D., Idaho State University, 2015. Reactor Physics Experiments; Non-destructive radiation imaging; Monte-Carlo Methods; Pre and Post Irradiation Analysis; Medical Imaging; Radiation Detection.

Christopher McDevitt, Associate Professor (352-846-3785) [cmcdevitt@ufl.edu] Ph.D., University of San Diego at California, 2008. Magnetic Fusion; Plasma Physics; Plasma Turbulence; Scientific Machine Learning; Runaway Electron Formation; Monte Carlo Methods. Website: <https://mcdevitt.mse.ufl.edu/>

DuWayne Schubring, Instructional Professor and NE Undergraduate/ABET Coordinator (352) 294-7870 [dlschubring@ufl.edu] Ph.D., University of Wisconsin-Madison, 2009. Two-phase flow (esp. annular flow), reactor thermal hydraulics, liquid metal fast-spectrum reactors, and nuclear engineering education/accreditation.

Donald E. Wall, Professor of Practice & Director University of Florida Training Reactor (352-273-2662) [donald.wall@ufl.edu] Ph.D., Florida State University, 2001. Nuclear reactor cooling systems; research reactor operation; actinide and fission product thermodynamics; research reactor operator licensing.

Nathalie A. Wall, Professor and Interim Director (352-273-0279) [Nathalie.Wall@ufl.edu] Doctorate, University of Paris, France, 1993. Radiochemistry; environmental behavior of radio nuclides; nuclear forensics. Website: <https://faculty.eng.ufl.edu/wall-research/>

Justin Watson, Associate Professor (352-273-0241) [justin.watson@ufl.edu] Ph.D., The Pennsylvania State University, 2010. Advanced Reactor Physics Methods, Nuclear Thermal and Electric Propulsion, Numerical Methods for Multiphysics Simulations, Machine Learning and High-Performance computing. Website: watson.mse.ufl.edu

Yong Yang, Associate Professor (352-846-3791) [yongyang@ufl.edu] Ph.D., University of Wisconsin- Madison, 2005. Nuclear reactor materials; materials degradations; corrosion; radiation damage; additive manufacturing; non-destructive evaluation Website: <http://manatee.mse.ufl.edu/>

Other Faculty

Juan C. Nino, Professor of Materials Science and Engineering (352-846-3787) [jnino@mse.ufl.edu] Ph.D., The Pennsylvania State University, 2002. Multifunctional ceramics; energy materials; dielectrics and ionic conductors in bulk and thin film; single crystal growth; nuclear materials and detectors; bioceramics.

Simon Phillpot, Distinguished Professor and Chair of the Department of Materials Science and Engineering (352-846-3782) [sphil@mse.ufl.edu] Ph.D., University of Florida, 1985. phonons and thermal transport; microstructure; clays, wasteforms; mechanical properties; radiation effects; intercalation; atomic resolution simulation methods List areas separated by semi-colons.

James S. Tulenko, Professor Emeritus (352-392-1427) [tulenko@ufl.edu] M.S., Massachusetts Institute of Technology, 1963. Nuclear fuel cycle; processing, fabrication and in-core and ex-core performance of nuclear fuel; multi-scale simulation of nuclear fuel; economic and environmental evaluation of all forms of electrical energy generation.

William Vernetson, Adjunct Faculty (retired) (352-392-1401x309) [vernet@ufl.edu] Ph.D., University of Florida, 1978. Reactor safety; reactor operations and training; systems design; probabilistic risk assessment; criticality analysis; neutron activation analysis.

Nuclear Science and Engineering Research Centers

Backscatter Radiography by Selective Detection (RSD) Lab: Dr. James Baciak. X-ray backscatter imaging for a wide variety of imaging applications focused on non-destructive testing in aerospace, nuclear facility, roadway/railway infrastructure, and medical applications.

HiPerGator: The Department of Research Computing provides comprehensive support for researchers that use HiPerGator, the university supercomputer. HiPerGator is currently ranked as the 136th most powerful supercomputer in the world, and third most powerful among public U.S. universities. UF anticipates acquiring some of the nation's most advanced AI machinery before the end of 2020, through collaboration and donation from Nvidia. Website: <https://www.rc.ufl.edu/services/hipergator/>

Nuclear Fuels & Materials Characterization Facility: Characterization of nuclear fuels and materials, including scanning electron microscope (SEM), focused ion beam (FIB), transmission electron microscope (TEM), energy dispersive spectrometer (EDS), electron backscattering diffraction (EBSD), and in-situ mechanical testing. Drs. Assel Aitkaliyeva & YongYang. Website: <https://rsc.aux.eng.ufl.edu/nfmcf/>

Optical Science and Remote Sensing Laboratory: The laboratory comprises approximately 1,000 ft² of quality laboratory space that is approved for use of radioactive materials and contains state-of-the-art experimental laser sources, plasma diagnostics, and scientific infrastructure. His group and laboratory conduct extensive work on machine learning, X-ray imaging, laser remote sensing of nuclear materials, laser induced plasmas, and chemistry of actinides in plasma for nuclear forensics, fuel cycle, and security applications.
Dr. Kyle C. Hartig

Radiochemistry Laboratory: Radioanalytical tools and instrumentations for nuclear fuel cycle applications, including environmental behavior of radionuclides, nuclear forensics, and radiopharmaceutical compounds.
Dr. Nathalie A. Wall.

Radiation Detection and Nuclear Instrumentation 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. Laboratory space and equipment is also provided for advanced research in radiation detector development. Other non-destructive testing systems are also available for investigative/educational purposes.

Radiation measurement and detection system labs: Labs focused on radiation measurements, radiation detector development; new radiation detector materials; detector testing and characterization for gamma-ray spectroscopy; Radiation -detection interaction measurements, Neutron detector development and characterization, Radiation data Analysis, non-proliferation and treaty verification; nuclear security.
Drs. James E. Baciak & Andreas Enqvist.

Simulation and modelling center: Investigates the co-evolution of microstructure and properties of materials in harsh environments using multiscale modeling and simulation (Dr. Tonks). Kinetic simulation of magnetic and inertial confinement fusion plasmas (Dr. McDevitt). Coupled multi -scale, multi-physics simulations for design, operation, and safety analysis of light water and Gen IV nuclear power systems (Dr. Watson). Atomic-level simulation of fuel systems and waste forms (*Dr. Phillpot*).

University of Florida Training Reactor (UFTR): A 100 kW Argonaut-class nuclear reactor (plate-fuel, split core) with multiple neutron beam ports and a fast-RABBIT pneumatic tube system, which allows short, online irradiations of samples, and rapid withdrawal for measurement. The UFTR is used for training and demonstration.

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	7/24-6/25	7/25-6/26
Masters	3	10
Ph.D.	2	2

Number of Graduates

Graduate Student Enrollment: 30 Masters/ 28 Ph.D.

Nuclear Science and Engineering Faculty

Indrajit Charit, Department Chair and Professor (208-757-5409) [icharit@uidaho.edu] Ph.D., Missouri University of Science and Technology, 2004. Nuclear materials; structural and fuel cladding materials; radiation effects on materials; high-temperature mechanical behavior of materials; advanced manufacturing. Website: uidaho.edu/people/icharit

Robert Borrelli, Associate Professor (208-533-8122) [rborrelli@uidaho.edu] Ph.D. University of California - Berkeley, 2006. Advanced fuel cycle analysis; nuclear hybrid energy systems analysis; pyroprocessing; cybersecurity; plant modernization; digital I&C; open -source scientific computing. Website: uidaho.edu/people/rborrelli

Amin Mirkouei, Associate Professor (208-757-5420) [amirkouei@uidaho.edu] Ph.D. Oregon State University, 2016. Sustainability and life cycle assessment; food-energy-water systems; renewable materials and biotechnology; rare earth element and mineral extraction; smart manufacturing using AI/ML solutions. Website: uidaho.edu/people/amirkouei

Krishan Raja, Professor (208-757-5406) [ksraja@uidaho.edu] Ph.D., Indian Institute of Technology, 1993. Materials for extreme environments; nuclear materials; electrochemical engineering; energy conversion and storage materials; remaining life assessment of engineering components. Website: uidaho.edu/people/ksraja

John Russell, Associate Research Professor, Special Assistant to the Dean of Engineering (208-533-8164) [jtrussell@uidaho.edu] Ph.D. University of Illinois-Chicago, 2012. Atomistic simulation and modeling; materials for energy applications; advanced manufacturing for extreme environments; science and technology policy. Website: uidaho.edu/people/jtrussell

Dajie Sun, Assistant Professor, Ph.D. University of California, Berkeley, 2021. Small modular and advanced reactors, waste management and disposal, thermal hydraulics, reactor physics

Website: uidaho.edu/engineering/academics/nuclear-engineering-industrial-management

Vivek Utgikar, Professor (208-885-6970) [vutgikar@uidaho.edu] Ph.D., University of Cincinnati, 1993.

Advanced fuel cycles; hydrogen and energy systems; energy storage.

Website: uidaho.edu/people/vutgikar

Alex Vakanski, Associate Professor (208-757-5422) [vakanski@uidaho.edu] Ph.D. Toronto Metropolitan University, 2013. Machine learning and artificial intelligence; project management; computer vision and image processing; robotics; learning from demonstration, vision-based control; biomedical informatics.

Website: uidaho.edu/people/vakanski

Haiyan Zhao, Associate Professor (208-533-8123) [haiyanz@uidaho.edu] Ph.D., Virginia Polytechnic University, 2009. Catalysis for environment and fuels; electrochemistry; molten salts/ionic liquids; pyroprocessing; fuel cycle. Website: uidaho.edu/people/haiyanz

Other Faculty

Matthew Bernards, Associate Professor, NASA Idaho Space Grant Consortium Director (208-885-2150) [mbernards@uidaho.edu] Ph.D., University of Washington, 2008. Beta-voltaic micro batteries; biology-material interfacial interactions; nuclear safeguards and security.

Website: uidaho.edu/people/mbernards

Samrat Choudhury, Adjunct Faculty, Ph.D., Pennsylvania State University, 2008. Nuclear fuel; materials for extreme environments; machine learning

Robert Hiromoto, Professor [hiromoto@uidaho.edu] Ph.D., California State University – Long Beach, 1978. Computational parallelism; optimization reasoning; high performance computing.

Website: uidaho.edu/people/Hiromoto

Torrey Mortenson, Adjunct Faculty, Ph.D., University of Idaho, 2024. Human factors/human performance.

Lee Ostrom, Emeritus [ostrom@uidaho.edu], Ph.D. Texas Tech University, 1998. Project management; risk assessment; nuclear safety; industrial ergonomics.

You Qiang, Professor (208-885-7558) [youqiang@uidaho.edu] Ph.D., Albert Ludwig University-Freiburg, 1997. Nanomaterials and nanotechnology for nuclear energy; neutron radiation and instrumentation; condensed matter physics. Website: uidaho.edu/people/youqiang

Piyush Sabharwall, Adjunct Faculty, Ph.D., University of Idaho, 2009. Heat transfer; fluid mechanics; thermal design; thermodynamics; nuclear safety analysis.

Robert Smith, Emeritus [smithbob@uidaho.edu] Ph.D., New Mexico Mining and Technology, 1984. Nuclear waste disposal and management; aqueous biogeochemistry; groundwater contamination remediation; geological carbon sequestration; geothermal energy.

Dennis Tucker, Adjunct Faculty, Ph.D., University of Florida, 1983. Nuclear thermal propulsion.

Nuclear Science and Engineering Research Centers

Critical Materials and Energy Systems Innovation Center (CMESIC)

Machine Intelligence and Data Analytics Lab (MIDA) – midalab.net

Reconfigurable Attack/Defend Instructional Computing Lab (RADICL)

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	7/24-6/25	7/25-6/26
B.S.	21	27
Masters	12	10
Ph.D.	13	11

Number of Graduates

Graduate Student Enrollment: 8 Masters/ 98 Ph.D.

ABET Accreditation: Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Science and Engineering Faculty

Rizwan Uddin, Department Head and Professor (217-244-4944) [rizwan@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 1987. Reactor thermal hydraulics; computational methods; nuclear reactor theory; homogenization techniques; nuclear engineering education; virtual reality; computational biology; nonlinear dynamical systems. Website: <http://verl.npres.illinois.edu>

Syed Bahauddin Alam, Assistant Professor (217-300-5835) [alams@illinois.edu] Ph.D., University of Cambridge, 2018. Digital Twin for nuclear systems; Real-time and remote monitoring; Autonomous operations; Explainable, Trustworthy, & Interpretable Machine Learning techniques; Cybersecurity; Uncertainty quantification; MultiCriteria decision-making. Website: <https://sbahauddin.tech/>

Daniel Andruczyk, Research Associate Professor (217-244-4583) [andruczy@illinois.edu] Ph.D., The University of Sydney-Australia, 2006. Experimental plasma and fusion research; fusion materials; plasma material interaction; plasma facing components; plasma diagnostics; plasma heating.
Website: <https://npres.illinois.edu/people/profile/andruczy> and <https://cpmi.illinois.edu/about-cpmi/>

Caleb Brooks, Professor and Donald Biggar Willett Faculty Scholar (217-265-0519) [csbrooks@illinois.edu] Ph.D., Purdue University 2014. Nuclear thermal hydraulics and reactor safety; boiling heat transfer; modeling and experiment of multiphase flows; multiphase flow instrumentation; microreactors.
Website: <https://mtdl.npres.illinois.edu/> and <https://npres.illinois.edu/research/microreactor-rdd-center>

Davide Curreli, Professor and Donald Biggar Willett Faculty Scholar (217-300-1787) [dcurreli@illinois.edu] Ph.D., University of Padova, Italy, 2011. Plasma modeling using fluid and kinetic models; plasma -material interactions; plasma sources; transport phenomena in plasmas. Website: <https://npre.illinois.edu/people/profile/dcurreli> and <https://curreli.npre.illinois.edu/>

Angela Di Fulvio, Associate Professor (217-300-3739) [difulvio@illinois.edu] Ph.D., University of Pisa, Italy, 2012. Neutron detection, spectroscopy, dosimetry, and imaging; detection systems and inference algorithms for safeguards and nonproliferation applications; measurement-aided artificial intelligence clinical decision support. Website: <https://nmlab.npre.illinois.edu/>

Tomasz Kozlowski, Professor and Associate Head for Undergraduate Programs (217-333-4096) [txk@illinois.edu] Ph.D., Purdue University, 2005. Reactor physics and thermal-hydraulics; reactor design and safety analysis; multi-physics methods and modeling; numerical analysis and computational methods. Website: <https://arts.npre.illinois.edu/>

Leon Liebenberg, Teaching Professor (217-300-5496) [leonl@illinois.edu] Ph.D., University of Johannesburg, 2001. Energy sustainability; Mass communication of sustainability; Demand -side management; Heat transfer enhancement; Pedagogies of engagement; Emotional learning strategies; Entrepreneurial thinking and design thinking to enhance curricula. Website: <https://npre.illinois.edu/people/profile/leonl>

Ling-Jian Meng, Professor (217-333-7710) [ljmeng@illinois.edu] Ph.D., University of Southampton-United Kingdom, 2001. Professor Meng works on radiological science and technology for healthcare applications. The Meng lab specializes in high-performance semiconductor imaging sensors, positron emission tomography (PET), single photon emission computed tomography (SPECT), and functional X-ray CT instrumentations for the diagnosis and treatment of cancer, cardiovascular diseases, and neural degenerative disorders. Website: <http://radimg.npre.illinois.edu>

Zahra Mohaghegh, Professor and Donald Biggar Willett Faculty Scholar (217-300 5076) [zahra13@illinois.edu] Ph.D., University of Maryland, College Park, 2007. Probabilistic risk assessment for conventional power plants and advanced reactors; AI trustworthiness in socio-technical risk analysis; probabilistic physics-of-failure analysis; human-system reliability modeling; uncertainty quantification; risk- informed regulation and policymaking for the safety and economic viability of complex technological systems. Website: <https://npre.illinois.edu/people/profile/zahra13>

April Novak, Assistant Professor (217-300-5822) [ajnovak2@illinois.edu] Ph.D., University of California, 2020. Computational thermal-hydraulics, multiscale and multiphysics methods, Monte Carlo transport, high performance computing, reactor design. Website: <https://npre.illinois.edu/people/profile/ajnovak2>

Dren Qerimi, Research Assistant Professor and Associate Director for the Illinois Plasma Institute (217-265-5135) [dqerimi@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 2021. Semiconductor Processing including etching, deposition and EUV lithography. Atmospheric-pressure plasmas for material synthesis. Website: <https://ipi.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. Website: <http://mragheb.com/>

R. Mohan Sankaran, Donald Biggar Willett Professor and Associate Head for Graduate Programs (217-244-7316) [rmohan@illinois.edu] Ph.D., California Institute of Technology, 2004. Low-temperature, atmospheric-pressure plasmas; plasma synthesis of nanoparticles; plasma-liquid electrochemistry; plasma synthesis of chemicals; plasma-assisted additive methods to thin-film fabrication. Website: <https://speclab.npre.illinois.edu/>

James F. Stubbins, Donald Biggar Willett Professor (217-333-6474) [jstubbin@illinois.edu] Ph.D., University of Cincinnati, 1975. Japan WPI International Institute on Carbon Neutral Energy Research; 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; energy analysis and policy. Professional Engineer.

Lorenzo Vergari, Assistant Professor (217-300-6605) [vergari@illinois.edu] Ph.D., University of California, Berkeley, 2023. Chemistry of coolants and blankets for advanced fission and fusion reactors, molten salt chemistry and corrosion, interactions with ceramics and metals, irradiation effects, transport of isotopes, electrochemistry, data science applications to materials characterization. Website: [https:// abc.npre.illinois.edu](https://abc.npre.illinois.edu)

Jianqi Xi, Assistant Professor (217-300-6494) [jianqixi@illinois.edu] Ph.D., University of Tennessee- Knoxville, 2017. Applying integrated multiscale models and experimental techniques to the study of radiation & corrosion degradations of nuclear materials, as well as employing machine learning approaches to the design of nuclear materials. Website: <https://publish.illinois.edu/modeling-nuclear-materials/>

Other Faculty

Shiva Abbaszadeh, Adjunct Associate Professor (217-300-2542) [sabbasza@illinois.edu] Ph.D., University of Waterloo, Canada, 2014. Radiation detection and instrumentation for molecular imaging; biomedical devices and sensors; data acquisition and readout electronics; computational problem solving; quantitative characterization of biological processes.

John R. Abelson, Affiliate Professor Emeritus (217-333-7258) [abelson@illinois.edu] Ph.D. Stanford University, 1987. Chemical vapor deposition of coatings using novel precursors to afford metals, oxides, nitrides, and borides for extreme environments. Surface mechanisms leading to superconformal growth, ultra-smoothness, and filling of deep features. Website: [http:// www.matse.illinois.edu/directory/profile/abelson](http://www.matse.illinois.edu/directory/profile/abelson)

Jont B. Allen, Affiliate Professor (217-369-7711) [jontalle@illinois.edu (alt: jontallen@ieee.org)] Ph.D., The University of Pennsylvania, 1970. Cochlear modeling; middle ear modeling; mathematical physics; Solar desalination of sea water. Website: <http://auditorymodels.org/>

Stephen Boppart, Affiliate Professor (217-244-7479) [boppart@illinois.edu] Ph.D., Massachusetts Institute of Technology, 1998; M.D., Harvard Medical School, 2000. Optical diagnostics of cancer; medical engineering; image-guided surgery; optical coherence tomography; lasers in medicine and biology; optical biomedical imaging. Website: <http://biophotonics.illinois.edu/>

Paul T. Debevec, Affiliate Professor Emeritus (217-333-0285) [debevec@illinois.edu] Ph.D., Princeton University, 1972. Precision measurements of fundamental properties of the muon as a search for physics beyond the Standard Model. Website: <https://physics.illinois.edu/people/directory/profile/debevec>

Thomas J. Dolan, Adjunct Professor (217-333-2295) [dolantj@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 1970. Nuclear fusion technology; molten salt fission reactors; thorium energy; low energy nuclear reactions.

Brent J. Heuser, Professor (217-333-9610) [bheuser@illinois.edu] Ph.D., The University of Michigan, 1990. Neutron detection, spectroscopy, dosimetry, and imaging; detection systems and inference algorithms for safeguards and nonproliferation applications; measurement-aided artificial intelligence clinical decision support. Website: <https://publish.illinois.edu/h-lab-npre/>

Matthias Grosse Perdekamp, Affiliate Professor (217-333-6544) [mgp@illinois.edu] Ph.D., University of California, Los Angeles, 1995. Research interest in studying the properties and dynamics of the quark gluon plasma (QGP) produced in the collisions of large nuclei at the Relativistic Heavy Ion Collider (RHIC) at BNL and the Large Hadron Collider (LHC) at CERN; measurements of proton-nucleus and proton-proton collisions both as reference systems for nucleus-nucleus collisions and as a place to look for the color glass condensate; measurements of transverse momentum dependent nucleon spin structure using COMPASS (COMmon Muon Proton Apparatus for Structure and Spectroscopy) at CERN; development of Zero Degree Calorimeters (ZDCs) and Reaction Plane Detectors (RPDs) for the high radiation environment in the LHC tunnel. Website: <https://npre.illinois.edu/people/profile/mgp>

Timothy P. Grunloh, Principal Research Scientist (217-244-1504) [tgrunloh@illinois.edu] Ph.D., University of Michigan, 2016. Advanced reactors and applications integrated nuclear systems, computational fluid dynamics, reduced order modeling. Website: <https://npre.illinois.edu/people/profile/tgrunloh>

Brian E. Jurczyk, Adjunct Research Assistant Professor (217-721-4165) [bjurczyk@starfireindustries.com] Ph.D., MBA, University of Illinois at Urbana-Champaign, 2003. Area 1: High power impulse magnetron sputtering deposition and etching; atmospheric-pressure and low-pressure surface microwave plasmas; plasma-enhanced chemical vapor deposition and atomic layer processes; advanced thin-film materials development; Area 2: Compact particle accelerators for neutron generation & imaging; gamma-ray spectroscopy & elemental analysis; non-destructive inspection; x-ray and e-beam generation. Website: <http://www.starfireindustries.com>

Michael D. Robledo Kaminski, Adjunct Professor (217-333-2295) [mdkamins@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 1998. Research interests in radiochemistry; radioactive materials separations technologies; radiological decontamination; radiological and nuclear threat mitigation; spent nuclear fuel separations; nuclear materials analysis and security applications; pre and post detonation analysis; magnetic based separations; nano-magnetic materials; drug delivery vectors; portable CBRN detection systems.

Ernie J. L. Kee, Research Associate Professor (217-333-2295) [erniekee@illinois.edu] B.S., University of Idaho, 1978. Research interests in light water reactor risk assessment, operations, research, performance evaluation, and maintenance; operations in the US Navy; thermal-hydraulic analysis at INL LOFT experimental facility; fuel thermalhydraulic analysis EXXON Nuclear; South Texas Project Nuclear Operating Company; dynamic thermal-hydraulics analysis with RELAP5 and TRAC; commercial nuclear reactor Shift Technical Advisor; generation risk assessment; unit reactor engineer reactor management surveillance testing; emergency response organization technical support center nuclear engineer; fuel reliability engineer; reactor power calorimetry analysis and uncertainty management.

Kyekyoon Kim, Affiliate Professor (217-333-7162) [kevinkim@illinois.edu] Ph.D., Cornell University, 1971. Tailored organometallic, Sol-Gel processing, charged liquid cluster beam deposition and chemical vapor deposition; controlled fabrication of thin films, nanofibers, and nanoparticles using charged liquid cluster beams of precursor solutions; fabricating micro and nanoscale structures for development of new devices and material systems for controlled release, lighting, display, solar cells, photosensors, and power storage; fabricating uniform micro and nano spheres and capsules of biodegradable and biocompatible materials for advanced drug delivery and cell-based therapy; development of high power electronic devices based on III-V Nitride semiconductors using plasma assisted molecular beam epitaxy and selective area growth technology. Website: <http://tfcp.ece.illinois.edu/index.htm>

George H. Miley, Professor Emeritus (217-356-5402) [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://fsl.npre.illinois.edu>

David W. Miller, Adjunct Assistant Professor (217-855-3238) [dmiller@illinois.edu] Ph.D., Purdue University, 1976. Occupational dose reduction at nuclear power plants; colloidal source term removal and mitigation studies in primarycoolant at lightwater 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.

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.

Seyed A. Reihani, Senior Research Scientist (217-300-5077) [sreihani@illinois.edu] Ph.D., University of Maryland, College Park, 2005. Incorporating Physical Phenomena into Risk Models; Risk-Informed Designs; Application of Catalytic Combustion in Power Generation Systems; Modeling and Analysis of Fuel Cell Systems. Website: <https://soteria.npre.illinois.edu/>

William R. Roy, Adjunct Professor (217-840-9769) [wroy@illinois.edu] Ph.D., University of Illinois at Urbana-Champaign, 1985. Radioactive and hazardous waste management; decommissioning and environmental restoration; public policy and perception; author of Radioactive Waste Management in the 21st Century (2021) ISBN 978-981-122-829-2.

David N. Ruzic, Professor Emeritus and Director of the Illinois Plasma Institute (217-333-0332) [druzic@illinois.edu] Ph.D., Princeton University, 1984. Experimental fusion research especially the use of lithium as a plasma-facing component; plasma- material interactions; plasma processing of semiconductors; atmospheric-pressure plasmas for industrial processing and material creation; extreme ultraviolet (EUV) sources for lithography; physical and chemical vapor deposition especially high-powered impulse magnetron sputtering (HIPIMS); plasma diagnostics and plasma sources. Website: <http://cpmi.illinois.edu> and <https://ipi.illinois.edu/>

Clifford E. Singer, Emeritus 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>

Michael Stowell, Jr., Adjunct Research Associate Professor, Chief Innovation Officer, Lyten Inc. [mstowell@illinois.edu] Atmospheric pressure plasmas, material synthesis, composite materials, 3-D graphene. Website: <http://lyten.com>

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>

Dallas Trinkle, Affiliate Professor (217-244-6619) [dtrinkle@illinois.edu] Ph.D., The Ohio State University, 2003. Computational materials science: atomistics, electronic structure; mechanical behavior: plasticity and phase transformation at atomistic scale; defect properties: point defects, dislocations, interfaces; transport: interstitial diffusion, vacancy-mediated diffusion. Website <http://dtrinkle.matse.illinois.edu/dokuwiki/doku.php>

Yang Zhang (YZ), Adjunct Professor (217-300-0452) [zhyang@illinois.edu] Ph.D., Massachusetts Institute of Technology, 2010. Non-equilibrium physics and accelerated molecular simulations (long timescale phenomena, rare events, irreversibility, randomness); Physics and chemistry of liquids and complex fluid, especially under interfacial/non-equilibrium/extreme conditions (water, metallic liquids, molten salts, ionic liquid, electrolyte solutions); Neutron scattering, sources, and instrumentation); soft robotic sand human-compatible machines; Robots in extreme environments; Understandable artificial intelligence. Website: <http://z.engineering.illinois.edu>

Nuclear Science and Engineering Research Centers

The Advanced Blankets & Coolants (ABC) Laboratory, directed by Assistant Professor Lorenzo Vergari, carries out experimental research on high-temperature liquids with a mission to develop the new generation of coolants for advanced fission reactors and of breeding blankets for fusion reactors.

Website: <https://abc.npre.illinois.edu>

The Advanced Reactors and Fuel Cycles, directed by Associate Professor Kathryn Huff, seeks to advance the safety and sustainability of nuclear energy production through improved reactor designs, fuel cycle strategies, and waste management techniques. We achieve this by advancing computational methods and developing software for nuclear engineering with features essential to advanced reactor multiphysics modeling and fuel cycle simulation. Website: <https://arfc.npre.illinois.edu>

The Analysis of Reactor Transients and Stability Research Center, directed by Professor Tomasz Kozlowski, performs deterministic safety analysis by developing and validating advanced methods to accurately determine reactor safety margins and reactor behavior. By performing high-fidelity numerical predictions of the reactor behavior in abnormal transient scenarios of safety significance, our work supports the nuclear reactor safety analysis and increases the fidelity of primary system simulation. This approach is at the heart of nuclear power's excellent safety record -always striving to improve current tools and methods. Website: <https://arts.npre.illinois.edu>

The Center for Plasma Material Interactions (CPMI), directed by Professor David Ruzic, objective is to study plasma material interactions relevant to fusion, semiconductors, plasma manufacturing, and plasma nanosynthesis 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. Facilities include HIDRA: the Hybrid Illinois Device for Research & Applications, which is a major -scale stellarator and/or tokamak. HIDRA will be used for testing plasma material interactions, liquid lithium technologies, nanosynthesis and electron transport. Mock-up Entry Module for EAST (MEME) which is a major facility for development of plasma facing components and liquid metal technology allowing for plug and play systems to be built for EAST and other devices. Website: <https://cpmi.illinois.edu>

The Functional X-ray Imaging Laboratory (FXIL), directed by Professor Ling-Jian Meng, is an extensively equipped experimental facility dedicated to functional X-ray imaging, such as X-ray fluorescence Emission Tomography (FXET), X-ray Luminescence Computed Tomography (XLCT), and the study of physical, chemical and biological mechanisms underlying the interaction of ionizing radiation with living organisms. Website: <https://radimg.npre.illinois.edu>

The High Temperature Nuclear Material Laboratory (HTNML), directed by Professor James Stubbins, objective is to study nuclear material relevant to microstructure, properties, performance, and interactions with irradiation through microscopy, x-ray analysis, experimental approaches, and modeling for light water reactor, and advanced nuclear reactor. Material studied in this lab includes structural material: copper alloys, nickel - based alloys, stainless/austenitic/ferritic/ ODS steel, zirconium alloy, silicon-carbide composites, and fuel material: uranium dioxide, and cerium dioxide. Frederick Seitz Materials Research Laboratory (FS-MRL) in UIUC provides variety of analytical techniques. NSUF program supports activities of post irradiation examination (PIE). State-of-the-art characterization technologies such as IVEM, APS, and ATP enhance research progress via tight coloration with ANL, ORNL and INL. Projects are supported by Department of Energy (DOE) to further application and knowledge of nuclear material at elevated temperatures. Facilities includes in situ biaxial creep- fatigue system which is capable of dynamic measurement of tubular specimen's dimension change under high temperature creep-fatigue test. Website: <http://materials.npre.illinois.edu>

The Hybrid Illinois Device for Research and Applications (HIDRA) is the former WEGA stellarator that was housed at the Max-Planck Institute for Plasma Physics in Greifswald. It is predominantly run as a 5-period, $l = 2$, $m = 5$ classical stellarator but also has the capabilities to run as a tokamak. It is housed at the Center for Plasma Material Interactions (CPMI) and is used to do basic plasma material interaction experiments, material studies and liquid metal technology development. It was brought to Illinois in 2014. HIDRA has become the keystone in the NPPE and UIUC fusion research programs.

The Illinois Microreactor RD&D Center, directed by Professor Caleb Brooks, is focused on enabling a paradigm shift in safe deployment of nuclear power. Current research activities in this Center include microreactor modeling and simulation, siting analysis, market analysis, instrumentation, operations and reactor control, licensing, and policy. Website: <https://npre.illinois.edu/research/microreactor-rdd-center>.

The Illinois Nuclear Power Institute, directed by Professor Caleb S. Brooks, advances nuclear science and engineering through research, education, and collaboration that strengthen the nuclear workforce, support innovation in advanced reactor and fuel technologies, and enhances the safe, reliable, and sustainable use of nuclear energy for society. Website: <https://nuclearpower.illinois.edu>

The Illinois Plasma Institute (IPI), directed by Professors David Ruzic and Dren Qerimi, has the objective to do translational research between industry and the University working at TRL-5 and TRL-6 – putting successful university research directly into industrial projects. IPI has three current partners: Tokyo Electron (TEL), a semiconductor equipment manufacturer; Tokyo Ohka Kogyo (TOK), a semiconductor-processing chemical supplier; and LytEn, which uses proprietary unique energy-optimized plasmas at atmospheric pressure to make new nanomaterials at high production volumes. Employees and students from the partner companies work hand-in-hand with university personnel in 7,000+ sq ft. of secure laboratory space on the Research Park adjacent to campus. Website: <http://ipi.illinois.edu>

The Laboratory of Computational Plasma Physics (LCPP), directed by Professor Davide Curreli, develops theoretical and computational models for a variety of Plasma Physics and Plasma Chemistry applications ranging from fusion edge plasmas to industrial plasmas and nuclear forensic, utilizing advanced, predictive simulation capabilities on high- performance computing machines, and multi-physics multi-scale models. Website: <http://curreli.npre.illinois.edu/>

The Machine Learning and ARTificial Intelligence for Advancing Nuclear Systems (MARTIANS) Laboratory, directed by Assistant Professor Syed Bahauddin Alam, conducts research on Digital Twin for nuclear systems; Real-time and remote monitoring with autonomous operations for advanced reactors; Cybersecurity; Instrumentation and controls for structural health monitoring (SHM) technology, sensor technologies, Explainable AI.

The Modeling of Nuclear Materials (MNM), directed by Assistant Professor Jianqi Xi, primarily concentrates on developing integrative strategies to expedite the design of materials for advanced nuclear applications. More specifically, we will integrate multiscale modeling with advanced experimental techniques and state-of-the-art machine-learning algorithms to elucidate the connections between microstructure/microchemistry, corrosion, and radiation responses in nuclear materials. The group aims to furnish essential approaches for steering the development of advanced nuclear materials and predicting materials degradation in nuclear reactors. Research interests include: Multiscale modeling of microstructural evolutions of materials in nuclear applications; Chemical degradation of nuclear materials in corrosive coolant environments (e.g., molten salt and high-temperature water, etc.); Synergistic effects of radiation and corrosion on structural materials; Data driven materials design with desirable radiation/corrosion - resistant properties. Website: <https://publish.illinois.edu/modeling-nuclear-materials/>

The Multiphase Thermo-fluid Dynamics Laboratory, directed by Professor Caleb Brooks, conducts research focusing on two phase flow and heat transfer. Active research includes: Generating validation data for CFD and system analysis codes; Natural circulation and thermal hydraulic instability; Characterizing wall nucleation parameters in forced convective flows; Critical Heat Flux (CHF) on traditional and engineered surfaces; Two - fluid model with Interfacial Area Transport Equation (IATE); Two-Phase Flow in Molten Salt. Website: <https://mtdl.npre.illinois.edu/>

The Multiphysics and Multiscale (M&Ms) Laboratory, directed by Assistant Professor April Novak, aims to leverage advanced computational modeling to accelerate nuclear technology development by improving fission and fusion reactor designs through the development and application of accelerated, reliable, and robust numerical analysis techniques. The M&Ms Lab specializes in multiphysics, multiscale algorithms incorporating radiation transport and thermal-fluids.

The North American Technical Center (NATC) for the Information System on Occupational Exposure (ISOE), by Adjunct Assistant Professor David Miller, is located at the Department of Nuclear, Plasma, and Radiological Engineering. NATC is one of four technical centers for the Organization 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: <https://isoe-network.net>

The Nuclear Measurements and Neutron Metrology Laboratory (NML), directed by Associate Professor Angela Di Fulvio, is a neutron experimental facility for both NPPE students and researchers in NPPE and elsewhere. The lab is equipped with D-T and D-D neutron generators with an emission rate of $1E8$ and $1E10$ neutrons/s. The neutron flux density is well-characterized in energy and intensity employing various instruments, including novel multisphere spectrometers, deuterated scintillators, ionization chambers, long counters, calibrated to primary reference standards. Website: <https://nmlab.npre.illinois.edu>

The Radiological Imaging Laboratory (RIL), directed by Professor Ling-Jian Meng, is the home of a wide verity of projects on developing advanced imaging sensors, PET, SPECT, functional X-ray imaging techniques, and application-specific image processing techniques. It is also the hub for many ongoing collaborations with premier medical centers around the world to develop large-scale clinical imaging systems for the diagnosis and treatment of cancer, cardiovascular diseases, and brain disorders.

The Reactor Simulator Laboratory has a full-scope nuclear reactor simulator. It is used both for educational and research missions. This simulator can model a wide range of operational scenarios ---from normal operating conditions to transients and accidents in LWRs. The developer version allows the development of other non-LWR reactor simulators. This versatile and extensible simulator provides students, researchers, and faculty with a realistic, hands-on experience of reactor operations. The simulator is integrated into undergraduate and graduate coursework, allowing students to gain practical experience and a deeper understanding of nuclear engineering principles. Additionally, the simulator serves as a critical tool for research in areas such as hybrid energy systems, digital twins, and probabilistic risk assessment. The simulator's capabilities enable researchers to study remote operations, human factors, and human-machine interfaces in nuclear power plant automation.

The Socio-Technical Risk Analysis (SoTeRiA) Laboratory, directed by Professor Zahra Mohaghegh, develops advanced methodologies and computational platforms for AI-enabled socio-technical risk analysis of nuclear energy systems, with emphasis on both the existing fleet and advanced reactors. The laboratory integrates physical, human, organizational, and digital system interactions within unified risk frameworks to support risk-informed, performance-based analysis, licensing, and decision-making. Research is organized into two core areas: (1) computational risk assessment, including modeling and simulation of physics-of-failure mechanisms and human performance, uncertainty quantification, probabilistic risk assessment (PRA), financial risk analysis, and emerging technology risk assessment for AI/ML and digital twin-enabled systems; and (2) risk management and risk-informed policymaking, including development of methodologies for regulatory decision-making, licensing, and rulemaking under evolving technological and legal conditions. These efforts are supported by DOE, NRC, NSF, and industry partners and are disseminated through peer-reviewed publications and technical reports, including contributions to the International Atomic Energy Agency (IAEA). The laboratory also contributes to workforce development through coursework in system safety and probabilistic risk assessment and participation in international programs such as the OECD-NEA Nuclear Education, Skills, and Technology (NEST) initiative. Professor Mohaghegh has served on committees of the U.S. National Academies of Sciences, Engineering, and Medicine, contributing to studies at the intersection of technical innovation and policymaking in high-consequence systems. Website: <http://soteria.npre.illinois.edu>

The Virtual Education and Research Laboratory (VERL), directed by Professor Rizwan Uddin, goals are to span research, teaching, service and outreach. Tools used in this lab are innovative and mostly computer based. From fundamental advances in numerical methods; advanced modeling and simulation of different aspects of scientific and engineering problems; to virtual, 3D models for training, education and outreach, this laboratory is focused on development and use of new methods and tools to address fundamental scientific and applied engineering problems. Applications to problems specific to the field of nuclear power include advanced numerical methods development; high performance computing; neutronics, thermal hydraulics and coupled problems; digital I&C and cyber security of NPPs; etc. Website: <http://verl.npre.illinois.edu>

The Synthesis, Plasma, Energy, Conversion (SPEC) Laboratory, directed by Professor R. Mohan Sankaran, studies low-temperature plasmas for the synthesis of chemicals and materials, as a path towards decentralized, electrified, austere, and resilient manufacturing. Website: <https://speclab.npre.illinois.edu/>

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	7/24-6/25	7/25-6/26
B.S.*	12	11
Masters	2	4
Ph.D.	2	8

* Minor in Nuclear Engineering

Graduate Student Enrollment: 8 Masters/ 21 Ph.D.

Distance Education Program
Offers Reliability Engineering Graduate Courses and Degree Online
www.crr.umd.edu and www.mage.umd.edu

Nuclear Science and Engineering Faculty

Mohamad Al-Sheikhly, Professor (301-405-5214) [mohamad@umd.edu] Ph.D., University of Newcastle Upon TyneUK, 1981. Nuclear reactor chemistry; extraction of actinides; radiation effects on materials; SiC for TRISO nuclear fuel; radiovoltaic; Laboratory for Radiation and Polymer Science.

Michelle (Shelby) Bensi, Associate Professor (301-405-4248) [mbensi@umd.edu] Ph.D., University of California, Berkeley, 2010. Probabilistic risk assessment; Probabilistic hazard assessment (seismic, coastal, inland flooding, precipitation); machine learning; Bayesian networks; Website: riselab.umd.edu

Katrina M. Groth, Professor and Director, Center for Risk and Reliability (301-405-5215) [kgroth@umd.edu] Ph.D., University of Maryland, 2009. Probabilistic risk assessment; system safety; nuclear hydrogen production; human reliability analysis; Website: <https://crr.umd.edu/>

Mohammad Modarres, Professor (301-405-5226) [modarres@umd.edu] Ph.D., MIT 1980. Nuclear safety; probabilistic risk assessment; probabilistic fracture mechanics; Website: modarres.umd.edu

Yunfei Zhao, Assistant Professor (301-405-4019) [yzhao111@umd.edu] Ph.D., Tsinghua University, 2016. Dynamic probabilistic risk assessment; cyber-physical security; maintenance optimization; fault diagnostics and prognostics; Website: <https://rada.umd.edu/>

Other Faculty

Amber S. Johnson, Reactor Director (301-405-7756) [ajohns37@umd.edu] M.S., Rice University, 2004. Research reactor operations; neutron activation analysis; gamma irradiation; electron linear accelerators. Website: radiation.umd.edu

Mahmoud Massoud, Lecturer (301-405-2410) [mmassoud@umd.edu] Ph.D., University of Maryland, 1986. Thermal hydraulics of nuclear systems.

Nuclear Science and Engineering Research Centers

University of Maryland Radiation Facilities: Research facilities include a 250 kW TRIGA conversion nuclear reactor offering irradiations, neutron activation analysis, neutron radiography and a student reactor operator training program; Panoramic Co-60 Gamma Irradiator providing dose rates more than 1 MRad/hr; and 6 MeV Electron Linear Accelerator. Associated dosimetry and radiation metrology equipment are also available. Website: radiation.umd.edu

Center for Risk and Reliability (CRR): A global leader in safety, risk, reliability, and resilience research and education. CRR brings together 20 core faculties from across multiple engineering departments, performing fundamental and applied engineering research to develop novel techniques and tools ranging from predictive reliability and human reliability analysis methods to probabilistic risk analysis theory for complex systems. Applications include complex structures, systems and processes in nuclear energy and renewable energy. CRR is home to the Reliability Engineering educational program—the largest and most comprehensive graduate degree-granting program in the U.S., with over 500 graduates (M.S., M.Eng., Ph.D.) in its 40-year history. CRR laboratories include:

Systems Risk and Reliability Analysis Laboratory (SyRRA): Performs computational algorithms for addressing risk and reliability problems in complex systems, with main applications in energy and infrastructure.

Risk-Informed Solutions in Engineering Laboratory (RISE): Conducts research on probabilistic assessment of natural hazards and associated risks as well as applications of statistics and machine learning in risk assessment.

Risk and Decision Analysis Laboratory (RADA): Focuses on risk and decision analysis for complex industrial systems, including nuclear power plants and other electric power systems.

Probabilistic Physics of Failure (PPoF) and Fracture Laboratory: Conducts accelerated life testing for failure mechanisms and fracture mechanics of reactor, piping and other structures.

Cybersecurity Quantification Laboratory Performs computational and empirical studies using security data and focuses on understanding incidents, intrusion alerts, network flows and malicious activity towards/from target computers.

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	7/24-6/25	7/25-6/26
B.S.	4	9
Masters	0	0
Ph.D.	2	4

Number of Graduates

Graduate Student Enrollment: 10 (MSE)/ 5 Ph.D.

ABET Accreditation:

Bachelor of Science (BS) Degree in Nuclear Engineering option in Chemical Engineering

Distance Education Program

Offers Nuclear Engineering Courses Online

Nuclear Science and Engineering Faculty

Stephen T. Lam, Director, Nuclear Engineering Program and Associate Professor and [stephen_lam@uml.edu] (978-934-3138) Ph.D., Massachusetts Institute of Technology, 2020. Computational materials science; artificial intelligence; x-ray absorption spectroscopy; molten salts; nuclear materials; advanced reactors; high-field fusion. Website: <https://www.uml.edu/engineering/chemical/faculty/lam-stephen.aspx>

Sukesh Aghara, Professor, Nuclear Engineering Program (512-293-3388) [Sukesh_Aghara@uml.edu] Ph.D., The University of Texas at Austin, 2001. cyberphysical systems; safeguards; integrated security systems. Website: www.uml.edu/inssl

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

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

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

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.

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

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

Marco Marzo, Associate Director (978-934-5284) [Marco_Marzo@uml.edu] Ph.D., University of Karlsruhe, Germany, 1981. Nuclear non-proliferation, nuclear safeguards and security; nuclear material accountancy; state evaluation approaches.

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

Sirikul Sriprisan, Sr., Research Associate (978-934-2519) [Sikikul_Sriprisan@uml.edu] Ph.D., University of Tennessee, 2008. Radiation shielding and protection, mathematical modeling, space radiation transport, neutron and proton beam experiments.

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>

Integrated Nuclear Security and Safeguards Laboratory (INSSL) is a multidisciplinary laboratory structured to bring together the expertise in the Nuclear Science and Engineering programs and Center for Terrorism Security Studies to form strategic partnerships in the nuclear security and safeguards area. The INSSL laboratory personnel in partnership with industry and national laboratories work on research projects in radiation detection, material accountancy, and State evaluation processes. INSSL is also engaged in the development of MS and the Graduate Certificate program in Nuclear Security and Safeguards and specialized training programs in this area for working professionals.

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	7/24-6/25	7/25-6/26
B.S.	20	19
Masters	17	36
Ph.D.	16	17

Number of Graduates

Graduate Student Enrollment: 37 Masters/ 100 Ph.D.
ABET Accreditation: B.S.E. (N.E.R.S)

Nuclear Science and Engineering Faculty

Xiaodong Sun, Interim Chair and Professor (734-615-9749) [xdsun@umich.edu] Ph.D., Purdue University, 2001. Thermal hydraulics and reactor safety; two-phase flow experimentation, modeling, and simulation; interfacial structure characterization and bubble dynamics; high-temperature reactor thermal hydraulics; compact heat exchangers. Website: <https://ners.engin.umich.edu/people/sun-xiaodong/>

Todd R. Allen, Professor, Associate Dean for Research (734-647-5845) [traumich@umich.edu] Ph.D., University of Michigan, 1997. Nuclear & Climate Policy; Radiation Damage of Materials; High-Temperature Corrosion; Nuclear Fuels Website: <https://ners.engin.umich.edu/people/allen-todd/>

Scott D. Baalrud, Professor (734-615-5010) [baalrud@umich.edu] Ph.D., University of Wisconsin- Madison, 2010. Plasma theory; low temperature plasmas; high energy density plasmas; computational plasma physics Website: <https://ners.engin.umich.edu/people/baalrud-scott/>

Kevin G. Field, Professor (734-764-4260) [kgfield@umich.edu] Ph.D., University of Wisconsin- Madison, 2012. Advanced manufacturing, radiation effects, irradiation design and control, advanced characterization, small angle scattering, analytical microscopy, materials processing & design Website: <https://ners.engin.umich.edu/people/field-kevin/>

John E. Foster, 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: <https://ners.engin.umich.edu/people/foster-john/>

Fei Gao, Professor (734-615-0697) [gaofei@umich.edu] Ph.D., University of Liverpool, U.K., 1995. Computational Nuclear Materials; Radiation Detector Materials; Radiation Effects in Metals, ceramics and glasses; Multi-scale computer simulations of ion-solid interaction, electron-solid interaction, mechanical and electrical properties of nanostructures
Website: <https://ners.engin.umich.edu/people/gao-fei/>

Kyle C. Hartig, Associate Professor [khartig@umich.edu] Ph.D., Pennsylvania State University, 2016. Remote Sensing, Machine Learning, Radiation Interaction and Detection, Nuclear Nonproliferation, Forensics, Security, and Policy. Website: <https://ners.engin.umich.edu/people/hartig-kyle/>

Zhong He, Professor (734-764-7130) [hezhong@umich.edu] Ph.D., Southampton University, U.K., 1993. Room-temperature semiconductor gamma-ray imaging spectrometers and associated electronics.
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Kimberlee J. Kearfott, Professor (734-763-9117) [kearfott@umich.edu] Sc.D. and C.H.P., Massachusetts Institute of Technology, 1980. Radiation safety; radiation detection and dosimetry; environmental radioactivity; STEM outreach projects. Website: <https://ners.engin.umich.edu/people/kearfott-kimberlee/>

Brian Kiedrowski, Associate Professor (734-615-5978) [bckiedro@umich.edu] Ph.D., University of Wisconsin-Madison, 2009. Monte Carlo and deterministic particle transport methods; nuclear and atomic data; sensitivity analysis and uncertainty quantification.
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Brendan Kochunas, Associate Professor (734-763-3867) [bkochuna@umich.edu] Ph.D., University of Michigan, 2013. Computational reactor physics methods; multiphysics methods; data-driven methods; nuclear reactor design; parallel algorithms and high-performance computing.
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Karl M. Krushelnick, Professor (734-763-4877) [kmkr@umich.edu] Ph.D., Princeton University, 1994. Plasma physics; nuclear fusion; high-power lasers. Website: <https://ners.engin.umich.edu/people/krushelnick-karl/>

Carolyn C. Kuranz, Professor (734-615-6282) [ckuranz@umich.edu] Ph.D., University of Michigan, 2009. Plasma physics; high-energy-density physics; nuclear fusion; radiation hydrodynamics; hydrodynamic instabilities; magnetized plasmas. Website: <https://ners.engin.umich.edu/people/kuranz-carolyn/>

Ryan D. McBride, Professor (734-763-7504) [mcbrider@umich.edu] Ph.D., Cornell University, 2009. Plasma physics; high-energy-density physics; nuclear fusion; radiation generation; pulsed-power technology; plasma diagnostics; magnetically driven, cylindrically imploding systems.
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Sara Pozzi, Professor (734-615-4970) [pozzisa@umich.edu] Ph.D., Polytechnic of Milan, Italy, 2001. Radiation detection; nuclear nonproliferation; nuclear safeguards; homeland security; treaty verification; physics of fission. Website: <https://ners.engin.umich.edu/people/pozzi-sara/>

Majdi Radaideh, Assistant Professor (734-764-7679) [radaideh@umich.edu] Ph.D., University of Illinois, 2021. Multiphysics reactor design; advanced computing; autonomous control. Website: <https://ners.engin.umich.edu/people/radaideh-majdi/>

Stephen Raiman, Assistant Professor [sraiman@umich.edu] Ph.D., University of Michigan, 2016. Materials in extreme environments; high-temperature corrosion; radiation effects in materials; environmentally assisted cracking; materials compatibility with molten salts; mechanical behavior of materials. Website: <https://ners.engin.umich.edu/people/raiman-stephen/>

Alexander G.R. Thomas, 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: <https://ners.engin.umich.edu/people/thomas-alec/>

Aditi Verma, Assistant Professor [aditive@umich.edu] Ph.D., Massachusetts Institute of Technology, 2019. Design of nuclear and complex technologies; institutional infrastructures; equitable and participatory design; epistemic inclusivity; early-stage design processes; tools for complex systems designers. Website: <https://ners.engin.umich.edu/people/verma-aditi/>

Lumin Wang, Professor (734-647-8530) [lmwang@umich.edu] Ph.D., University of Wisconsin-Madison, 1988. Radiation effects; ion beam modification of materials; transmission electron microscopy; nanostructured materials; nuclear engineering materials. Website: <https://ners.engin.umich.edu/people/wang-lu-min/>

Won Sik Yang, Professor (734-647-8117) [wonyang@umich.edu] Ph.D., Purdue University, 1989. Nuclear engineering; reactor physics; computational methods; core design; fuel cycle analysis; fast reactors; accelerator-driven systems; sensitivity/uncertainty analysis; cross-section processing; stability and reliability analysis. Website: <https://ners.engin.umich.edu/people/yang-won-sik/>

Y Z, Professor (734-647-4338) [yzyz@umich.edu] Ph.D., Massachusetts Institute of Technology, 2010. Matter: rare events and long-timescale phenomena; liquids, glasses, complex fluids; statistical mechanics; accelerated molecular simulations; neutron scattering. Machine: soft robots; swarm robotics; robots in extreme environments. Website: <https://ners.engin.umich.edu/people/z-y/>

Peng Zhang, Associate Professor [umpeng@umich.edu] Ph.D., University of Michigan, 2012. Theory and modeling of nanoelectronics, electromagnetic fields and waves, plasmas, accelerator technology; electrical contacts; thin films; diodes; multipactor; breakdown; slow-wave structures; z-pinches; laser-plasma interaction; vacuum nano devices; ultrafast photoemission; plasmonic junctions; miniaturized light sources.

Other Faculty

Larry Aagesen, Adjunct Associate Professor (208-526-1861) [Larry.Aagesen@inl.gov] Ph.D., Northwestern University, 2010. Computational science; materials.

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Michael Atzmon, Professor Emeritus (734-764-6888) [atzmon@umich.edu]

Ph.D., California Institute of Technology, 1985. Thermodynamics and kinetics of materials; mechanical and thermal properties of metallic glasses. Website: <https://ners.engin.umich.edu/people/atzmon-michael/>

Alex F. Bielajew, Professor Emeritus (734-764-6364) [bielajew@umich.edu] Ph.D., Stanford University, 1982.

Theory of electron and photon transport; Monte Carlo theory and development; radiation dosimetry theory; radiotherapy treatment planning algorithms. Website: <https://ners.engin.umich.edu/people/bielajew-alex/>

Frederick W. Buckman, Adjunct Professor (734-764-4260) [fwb@umich.edu] Ph.D., Massachusetts Institute of Technology, 1970. Design, development, and operation of nuclear power plants; historical performance of plants and people; evolution of licensing and self-assessment processes.

Website: <https://ners.engin.umich.edu/people/buckman-frederick/>

Adam Burak, Assistant Research Scientist (734-764-4260) [ajburak@umich.edu] Ph.D., University of Utah,

2019. Molten salt chemistry; electrochemistry; high-temperature spent nuclear fuel reprocessing; severe-environment materials; molten salt corrosion; experimental and prototype design. Website:

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Milos Burger, Associate Research Scientist (734-764-8234) [milosb@umich.edu] Ph.D., University of Belgrade, 2015. Laser-matter interactions; plasma and laser spectroscopy; nonlinear optically driven processes in gases.

Website: <https://ners.engin.umich.edu/people/burger-milos/>

Mark B. Chadwick, Adjunct Professor [markchad@umich.edu] Ph.D., University of Oxford, 1990.

High-performance computing, algorithms, and theoretical science supporting stockpile modernization, national security missions, AI, and quantum discovery science.

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Jonathan Cirtain, Adjunct Professor [jwcirtain@bwxt.com] Ph.D., Montana State University, 2005. GIS data

science; space physics; spacecraft systems design; remote sensing analytics; nuclear rocket systems; nuclear medicine and human radiation effects. Website: <https://ners.engin.umich.edu/people/cirtain-jonathan/>

Shaun D. Clarke, Research Scientist (734-615-7830) [clarkesd@umich.edu] Ph.D., Purdue University, 2007.

Simulation techniques for active interrogation systems using high-energy photons; photoneutron energy spectra; multiplicity analysis. Website: <https://ners.engin.umich.edu/people/clarke-shaun/>

Denia Djokić, Assistant Research Scientist (734-764-4260) [djokic@umich.edu]

Ph.D., University of California, Berkeley, 2013. Environmental justice in advanced reactor siting; radioactive waste management; consent-based siting; technology assessment; equity and justice in nuclear energy policy.

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Thomas Downar, Professor Emeritus (734-615-9002) [downar@umich.edu] Ph.D., Massachusetts Institute of Technology, 1984. Computational nuclear reactor physics; reactor dynamics; coupled neutronics and thermal-hydraulics methods for safety analysis.

Website: <https://ners.engin.umich.edu/people/downar-thomas/>

Karthik Duraisamy, Professor (734-615-7270) [kdur@umich.edu] Ph.D., University of Maryland, College Park, 2005. Computational science and engineering; aerodynamics; high-speed flows; turbulence modeling; uncertainty quantification; rotorcraft aeromechanics; optimization.

Website: <https://ners.engin.umich.edu/people/duraisamy-karthik/>

Ronald M. Gilgenbach, Professor Emeritus (734-763-1261) [rongilg@umich.edu] Ph.D., Columbia University, 1978. Plasmas; fusion; z-pinch; intense electron beam physics; high-power microwave generation. Website: <https://ners.engin.umich.edu/people/gilgenbach-ronald/>

Mark Hammig, 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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James P. Holloway, Professor Emeritus (734-936-3126) [hagar@umich.edu] Ph.D., University of Virginia, 1989. Radiation transport; reactor physics; plasma kinetic theory; computational physics; nonlinear dynamics.

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Rui Hu, Adjunct Professor (630-252-1461) [hurui@umich.edu] Ph.D., Massachusetts Institute of Technology, 2010. Thermal hydraulics; reactor safety analysis; advanced reactors; multi-scale multi-physics modeling and simulation. Website: <https://ners.engin.umich.edu/people/hu-rui/>

Asif Iqbal, Assistant Research Scientist (517-512-8223) [asifiq@umich.edu] Ph.D., Michigan State University, 2021. Nonlinear plasma and vacuum discharge modeling; physics-consistent machine learning; RF-driven breakdown physics; multipactor discharges. Website: <https://ners.engin.umich.edu/people/iqbal-asif/>

Zhijie Jiao, Research Scientist (734-936-0166) [zjiao@umich.edu] Ph.D., Polytechnic University of New York, 2004. Irradiation-assisted stress corrosion cracking; high-temperature corrosion; radiation effects; microstructure evolution; TEM; FIB; atom probe tomography.

Website: <https://ners.engin.umich.edu/people/jiao-zhijie/>

Nicholas M. Jordan, Research Associate Professor (734-763-0213) [jordann@umich.edu] Ph.D., University of Michigan, 2008. Plasma physics. Website: <https://ners.engin.umich.edu/people/jordan-nicholas/>

Louis Jose, Assistant Research Scientist [louijos@umich.edu] Ph.D., University of Michigan, 2023. Plasma kinetic theory for strongly magnetized plasmas with gyrofrequency exceeding plasma frequency.

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Igor Jovanovic, Adjunct Professor (734-647-4989) [ijov@umich.edu] Ph.D., University of California, Berkeley, 2001. Radiation detection; nuclear security; high-power lasers and optics.

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Joel A. Kulesza, Adjunct Professor (505-667-5467) [jkulesza@umich.edu] Ph.D., University of Michigan, 2018. Advanced typesetting and automatic report generation; computer system automation; high-fidelity simulation; high-performance computing; system administration.

Website: <https://ners.engin.umich.edu/people/kulesza-joel/>

Mark Kushner, Professor (734-647-1695) [mjkush@umich.edu] Ph.D., California Institute of Technology, 1979. Computational low-temperature plasmas; plasma-surface interactions; plasma-liquid interactions; biotechnology applications. Website: <https://ners.engin.umich.edu/people/kushner-mark/>

Dale Lancaster, Adjunct Professor (814-574-1912) [dalelan@umich.edu] Ph.D., Massachusetts Institute of Technology, 1981. Criticality; spent fuel management; core design; fuel management.

Website: <https://ners.engin.umich.edu/people/lancaster-dale/>

Edward W. Larsen, Professor Emeritus (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: <https://ners.engin.umich.edu/people/larsen-edward/>

Y.Y. Lau, Professor Emeritus (734-764-5122) [yylau@umich.edu] Ph.D., Massachusetts Institute of Technology, 1973. Plasma and beam physics; high-power radiation sources; vacuum microelectronics. Website: <https://ners.engin.umich.edu/people/lau-yue-ying/>

John C. Lee, Professor Emeritus (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: <https://ners.engin.umich.edu/people/lee-john/>

Heath LeFevre, Assistant Research Scientist [hjlfe@umich.edu] Ph.D., University of Michigan, 2021. High-energy-density plasma physics; laboratory astrophysics; radiation hydrodynamics. Website: <https://ners.engin.umich.edu/people/lefevre-heath/>

Rebecca K. Lindsey, Assistant Professor (734-763-5142) [rklinds@umich.edu] Ph.D., University of Minnesota, Twin Cities, 2016. Chemistry in multiscale systems; material evolution under extreme conditions; advanced simulations; machine learning. Website: <https://ners.engin.umich.edu/people/lindsey-rebecca/>

Yong Ma, Assistant Research Scientist (734-239-3484) [yongm@umich.edu] Ph.D., Institute of Physics, University of the Chinese Academy of Sciences, 2016. Laser-plasma interactions; laser wakefield accelerators; advanced radiation sources. Website: <https://ners.engin.umich.edu/people/ma-yong/>

Annalisa Manera, Adjunct Professor (734-647-2433) [manera@umich.edu] Ph.D., Delft University of Technology, 2003. Experimental two-phase flow; thermal-hydraulics; CFD; multiphysics methods for reactor safety analysis. Website: <https://ners.engin.umich.edu/people/manera-annalisa/>

William R. Martin, Professor Emeritus (734-764-5534) [wrm@umich.edu] Ph.D., University of Michigan, 1976. Computational methods for the Boltzmann transport equation; deterministic and Monte Carlo methods. Website: <https://ners.engin.umich.edu/people/martin-william/>

Martha Matuszak, NERS Associate Professor & U-M Medical School Professor (734-936-4309) [marthamm@med.umich.edu] Ph.D., University of Michigan, 2007. Treatment planning and optimization for external beam radiotherapy; IMRT; VMAT; SBRT.
Website: <https://ners.engin.umich.edu/people/matuszak-martha/>

Thomas A. Mehlhorn, Adjunct Professor (505-363-6106) [thmehlho@umich.edu] Ph.D., University of Michigan, 1978. Numerical plasma simulation; ion stopping power; pulsed power; inertial confinement fusion.
Website: <https://plasmabay.engin.umich.edu/tom-mehlhorn/>

Jason T. Nattress, Adjunct Assistant Professor [jtnatt@umich.edu] Ph.D., University of Michigan, 2018. Radiation detection and imaging; nuclear security; neutron and gamma-ray spectroscopy; nuclear material characterization. Website: <https://ners.engin.umich.edu/people/nattress-jason/>

Jordan Noey, LEO Lecturer III & Adjunct Research Investigator (989-859-5014) [noeyjd@umich.edu] Ph.D., University of Michigan, 2025. Advanced radiation detection and dosimetry; environmental radiation monitoring; radiation transport modeling; calibration and analysis.
Website: <https://ners.engin.umich.edu/people/noey-jordan/>

Imre Pázsit, Adjunct Professor (46-31-772-3081) [imre@nephy.chalmers.se] Ph.D., Roland Eötvös University, 1975. Neutron fluctuations; stochastic neutron transport; inverse problems; reactor dynamics and diagnostics.
Website: <https://ners.engin.umich.edu/people/pazsit-imre/>

Victor Petrov, Associate Research Scientist (734-763-4626) [petrov@umich.edu] Ph.D., Institute of Engineering Physics & Moscow State Industrial University, 2008. Experimental and computational fluid dynamics. Website: <https://ners.engin.umich.edu/people/petrov-victor/>

Dipankar Ray, Adjunct Associate [dipray@med.umich.edu] Ph.D., Indian Institute of Science, 2001. Radiation pneumonitis and lung fibrosis; molecularly targeted cancer therapeutics.
Website: <https://ners.engin.umich.edu/people/ray-dipankar/>

Piyush Sabharwall, Adjunct Professor (734-764-4260) [Piyush.Sabharwall@inl.gov] Ph.D., University of Idaho, 2009. Applied heat transfer; thermal-hydraulics; energy storage; advanced reactors; hybrid energy systems.
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Volkan Seker, Assistant Research Scientist (734-764-7286) [vseker@umich.edu] Ph.D., Purdue University, 2007. High-temperature gas-cooled reactor physics; reactor analysis code development; parallel and high-performance computing. Website: <https://ners.engin.umich.edu/people/seker-volkan/>

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Katsuyo Thornton, Professor (734-615-1498) [kthorn@umich.edu] Ph.D., University of Chicago, 1997. Computational and theoretical investigations of microstructure and nanostructure evolution.
Website: <https://ners.engin.umich.edu/people/katsuyo-thornton/>

Peng Wang, Associate Research Scientist (734-763-3116) [wpf@umich.edu] Ph.D., University of Manchester, 2011. Corrosion behavior of zirconium alloys; high-temperature aqueous environments; electrochemical impedance spectroscopy. Website: <https://ners.engin.umich.edu/people/wang-peng/>

Gary S. Was, Professor Emeritus (734-763-4675) [gsw@umich.edu] Sc.D., Massachusetts Institute of Technology, 1980. Radiation materials science; materials degradation; ion beam modification; corrosion; hydrogen embrittlement; nuclear fuels. Website: <https://ners.engin.umich.edu/people/was-gary/>

David K. Wehe, Professor Emeritus (734-763-1151) [dkw@umich.edu] Ph.D., University of Michigan, 1984. Radiation measurements and applications. Website: <https://ners.engin.umich.edu/people/wehe-david/>

W. Geoffrey West, Adjunct Professor [pilatus@umich.edu] Ph.D., University of Michigan, 2011. Diagnostic medical and health physics consulting; imaging QA; radiation dose reduction; MRI operations; regulatory roles; imaging accreditation standards. Website: <https://ners.engin.umich.edu/people/west-geoff/>

Louise Willingale, Associate Professor (734-647-9543) [wlouise@umich.edu] Ph.D., Imperial College London, 2007. Intense laser-plasma interactions; laser-driven ion acceleration; relativistic laser propagation; proton deflectometry; electric and magnetic fields in laser-plasma interactions. Website: <https://ners.engin.umich.edu/people/louise-willingale/>

Yuefeng Zhu, Associate Research Scientist (734-763-8566) [zhuyuef@umich.edu] Ph.D., University of Michigan, 2012. Digital signal processing methods for pixelated 3-D Position Sensitive Room-Temperature Semiconductor Detectors. Website: <https://ners.engin.umich.edu/people/zhu-yuefeng/>

NERS Nuclear Science and Engineering Research Centers and Laboratories

Artificial Intelligence and Multiphysics Simulations (AIMS) Laboratory The AIMS Lab focuses on the intersection between nuclear reactor design, multiphysics modeling and simulation, advanced computational methods, and machine learning algorithms to drive advanced reactor research and improve the sustainability of the current reactor fleet. The lab develops software capabilities that can be deployed on experimental systems. Their current project involves advanced reactor optimization, autonomous control for microreactors, digital twin development for reactor systems, an explainable machine learning framework for licensable AI technologies, robotics and drone-based autonomous inspection, and the use of large language models for sentiment analysis of nuclear power around the United States.

Center for High Energy Density Laboratory Astrophysics Research (CHEDAR)

Researchers at CHEDAR study fundamental high-energy-density plasmas relevant to astrophysical systems, the National Nuclear Security Administration's mission of science-based stockpile stewardship, and inertial confinement fusion concepts. They create these systems using high-energy lasers and pulsed-power facilities and simulate them using the radiation hydrodynamics code CRASH. The research focus is on hydrodynamic instabilities, radiation hydrodynamics, and magnetized flows. Researchers also fabricate and characterize experimental targets and research novel diagnostic techniques. This is a National Nuclear Security Administration Stewardship Science Academic Alliances (SSAA) Center of Excellence.

Center for Magnetic Acceleration, Compression, and Heating (MACH)

Researchers at MACH explore hot, dense plasmas using powerful magnetic pulses, most commonly using z - pinch implosions that rely on magnetic fields to crush plasmas in cylindrical form toward the central “z” axis. The MACH team focuses on achieving symmetric compression, preparing to build more powerful fusion machines, and exploring fundamental physics. The center is an extremely flexible space that encourages student creativity to support research at national labs. Partner institutions include Cornell University, Imperial College London, Weizmann Institute of Science, Princeton University, UC San Diego, Massachusetts Institute of Technology, University of New Mexico, University of Rochester, University of Washington, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories. This is a National Nuclear Security Administration Stewardship Science Academic Alliances (SSAA) Center of Excellence.

Detection for Nuclear Nonproliferation Group Laboratory

The DNNG Laboratory is focused on the development of new tools and techniques for the detection and characterization of special nuclear materials, such as uranium and plutonium, and narcotics. Our research has applications in the areas of nuclear safeguards, nuclear nonproliferation, and homeland security. We develop new measurement systems based on scintillation detectors for the detection of neutron and gamma -ray sources. DNNG research also focuses on characterizing the properties of new scintillation materials (e.g., efficiency, light output, anisotropic response, etc.), including readout systems to improve pulse-shape discrimination performance. This laboratory is used in the senior -graduate laboratory course in detection for nuclear non-proliferation, NERS 535. Website: dnng.engin.umich.edu/

Experimental and Computational Multiphase Flow (ECMF) Laboratory

The lab was established in 2013 with the purpose of advancing and understanding thermal-hydraulics and fluid-dynamics phenomena of relevance for nuclear applications. In the ECMF lab, we perform fluid dynamic experiments using in-house advanced state-of-the-art high-resolution experimental techniques such as wire-mesh sensors and Particle Image Velocimetry (PIV) combined with novel refractive-index matching techniques. Experimental facilities in the lab are used to investigate the propagation of stratified fronts, mixing in plena, and turbulence-induced thermal fatigue in isolated branch lines. The highly resolved (in time and space) experimental data are used to establish a database for the validation and further development of Computational Fluid Dynamics models.

Fastest Path to Zero Initiative

The Fastest Path to Zero Initiative is dedicated to addressing challenging questions about how policymakers, researchers, and communities can collaborate to achieve ambitious climate goals in Michigan and nationwide. The initiative focuses on building and maintaining external and cross-campus collaborations to optimize the use of nuclear energy in the 21st century. It emphasizes participatory research by developing inclusive approaches to the design and deployment of nuclear energy infrastructure. The team also creates user-friendly decision-support tools to assist advanced nuclear companies in locating potential hostcommunities. A significant aspect of Fastest Path's work involves researching historical and current nuclear equity and justice issues, as well as understanding community needs and societal preferences. Website:

<https://fastestpathtozero.umich.edu/>

G rard Mourou Center for Ultrafast Optical Science (CUOS)

CUOS researchers develop optical instrumentation and techniques to generate, manipulate, and detect ultrashort and ultrahigh-peak-power light pulses. They use these ultrashort pulses to study ultrafast physical phenomena in atomic, nuclear, plasma, and materials physics, solid-state electronics, high-energy-density physics, and biomedicine. The center houses ZEUS, the NSF-supported, highest-power laser system in the U.S., which facilitates exploration of fundamental yet unresolved questions in non-linear quantum electrodynamics within relativistic plasmas, such as quantum radiation reaction and electron-positron pair production mechanisms. Website: cuos.engin.umich.edu

High-Resolution TH Imaging Laboratory

In the high-resolution TH imaging laboratory, we develop and apply measurement techniques for quantitative imaging of single-phase and multiphase flows in complex geometries and high-pressure systems. The latest developments include an in-house, high-resolution gamma tomography system and a high-speed X-ray radiography system. Additional high-resolution instrumentation employed in the lab includes wire-mesh sensors and fiber optic probes. The high-resolution experiments are being performed to investigate two-phase flows in fuel bundles, helical coils, and post-CHF two-phase flow regimes at high pressure/temperature. Additional experiments include setups to investigate the behavior of heat pipes for micro-reactor applications and hydrogen migration in nuclear fuel cladding materials.

High-Temperature Corrosion Laboratory (HTCL)

The 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. The corrosion laboratory has unique facilities for conducting both high and low-temperature corrosion, stress corrosion cracking (SCC), electrochemical testing, and mechanical testing. Website: <https://htcl.engin.umich.edu>

Irradiated Materials Testing Complex (IMTC)

The IMTC provides the capability to conduct high-temperature corrosion and stress corrosion cracking of neutron-irradiated materials and to characterize the fracture surfaces after failure. The laboratory consists of a high-temperature autoclave, circulating water loop, load frame, and servo motor for conducting constant extension rate tensile (CERT) and crack growth rate (CRG) tests in subcritical or supercritical water up to 600°C. Website: <https://imtl.engin.umich.edu/>

Materials in High Temperatures and Extreme Environments (MiHTEE) Laboratory

The MiHTEE Lab supports innovative nuclear technologies by recreating extreme environments and developing new materials that can withstand those extremes. The laboratory includes facilities for multiple molten salt or liquid metal loops, glove boxes for handling air-sensitive materials, including uranium and beryllium-containing materials, high-temperature furnaces, a hot isostatic press for fabricating materials, and analytical equipment for working with molten salts and other materials. Website: <https://sites.lsa.umich.edu/mihtee/>

Michigan Augmented Reality Laboratory

Augmented reality (AR) technologies using head-mounted devices allow the display of complex data to a user directly as holographic impressions. We are interested in visualizing radiation fields and radioactive sources, both for education and real-world source search scenarios. In the AR creator's space, we provide the testing grounds for such technologies, bringing together computer scientists and nuclear engineers to develop a new way of perceiving radiation.

Michigan Center for Materials Characterization ((MC)2)

((MC)2 houses state-of-the-art equipment, including aberration-corrected transmission electron microscopes, dual-beam focused ion beam/scanning electron microscopes, an x-ray photoelectron spectrometer, a tribo-indenter, an atomic force microscope, and an atom probe tomography instrument. A few of the instruments contained at the laboratory include Tescan MIRA3 FEG SEM, Tescan RISE SEM, FEI Quanta 3D e-SEM/FIB, FEI Nova 200 Nanolab SEM/FIB, and more. Website: <https://mc2.engin.umich.edu/>

Michigan Ion Beam Laboratory (MIBL)

The Michigan Ion Beam Laboratory for Surface Modification and Analysis (MIBL) 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. The lab houses a 3 MV pelletron accelerator, a 1.7 MV tandem accelerator, and a 400 kV ion implanter. This laboratory is used in the senior laboratory course NERS 425, Applications of Radiation. Website: mibl.engin.umich.edu

Michigan LINAC Laboratory

This approximately 2,000 ft² laboratory houses a Varian M9 electron LINAC and associated detection systems. The Varian M9 is a commercially available LINAC that accelerates electrons up to 9 MeV onto a high -Z converter material to produce X-rays with a Bremsstrahlung spectrum up to 9 MeV. The accelerator is contained in a room in the corner of the lab whose walls act as additional collimation for the X-ray beam. After the collimator, the approximately 15 m long beamline is used for active interrogation experiments. Additionally, the beamline is used to perform time-of-flight characterization of the photonuclear reaction products. This facility enables active interrogation experiments using a variety of targets available on campus, including depleted uranium, lead, and tungsten.

Michigan Scintillator Laboratory

At the Michigan Scintillator Laboratory, we melt-cast new scintillators, such as new plastic and organic glass scintillators. The laboratory is equipped with fume hoods, scientific ovens, and other relevant equipment. We also develop multi-detector arrays to characterize the emissions from nuclear fission. Specifically, we have recently designed and developed a spherical array of 40 organic stilbene detectors and a custom fission chamber in collaboration with Argonne National Laboratory.

Nuclear Measurements Teaching Laboratory

The Nuclear Measurements Teaching Laboratory introduces students to the devices and techniques most common in nuclear measurements. Experiments include the operation of gas-filled, solid-state, and scintillation detectors for charged particles, gamma rays, and neutrons. The laboratory has four stations, each with an oscilloscope, a suite of nuclear electronics, a high-purity germanium detector, and a PC equipped with a multichannel analyzer.

Nuclear Plant Simulation Laboratory (NPSL)

The NPSL was established in 2019 with the installation of the Generic Pressurized Water Reactor Simulator. This simulator represents the entire instrumentation and control (I&C) system of a three-loop Westinghouse PWR plant with all its gauges, knobs, recorders, and control systems. The Simulator satisfies the U.S. Nuclear Regulatory Commission requirements for licensed reactor operator training and is being modified to represent the I&C system of the six-unit NuScale SMR plant under development. With an investment of \$105,000 made for the Simulator, it is currently used for a cyber-security NEUP project and for various nuclear reactor analysis and design classes. With the development of efficient and secure digital I&C systems looming as a new frontier for nuclear engineers, we plan to use the Simulator as an integral part of advanced nuclear plant development projects going forward. The NPSL also includes an interactive Virtual Reality (VR) model of Michigan's Ford Nuclear Reactor. This environment is used for teaching and conducting experiments that were previously a part of the NERS curriculum when the FNR was still operational. This platform, which was developed with support from Michigan's Center for Academic Innovation, also provides a unique digital infrastructure for research into developing digital twin and VR technology for nuclear engineering applications.

Nuclear Reactor Analysis and Methods (NURAM) Center

NURAM provides technical expertise in reactor analysis, including design and safety analysis, and methods development. NURAM includes faculty, research scientists, postdoctoral fellows, and PhD students. NURAM faculty, staff, and students are involved in the development of advanced computational methods for the analysis of coupled nuclear reactor phenomena, including neutron transport, thermal/hydraulics, materials performance, and validation of these methods against experimental data. Specifically, NURAM develops and maintains the U.S. Nuclear Regulatory Commission's core simulator PARCS, and the next -generation high-fidelity neutronics code MPACT that is a part of VERA. The group also develops and maintains the AGREE code for the US NRC, as well as derivatives for industry partners. In addition to developing codes, the personnel of NURAM also maintain expertise in many other computational tools used for reactor analysis. These tools come from U.S. National Labs, many from the NEAMS program, including VERA, Griffin, BISON, RAVEN, SAM, MC2, SHIFT, SCALE, MCNP, and DIF3D. NURAM also maintains academic licenses to many industry products such as Westinghouse's APA package, CASMO-4/SIMULATE, HELIOS, STAR-CCM+, ANSYS, and more. Website: <https://nuram.engin.umich.edu>

Nuclear Reactor Design and Simulation Laboratory (NRDSL)

NRDSL aims to develop advanced nuclear reactors and associated fuel cycle concepts and core design and fuel cycle analysis methods by integrating advances in reactor physics, thermal -hydraulics, materials, and computing technologies.

Plasma, Pulsed Power, and Microwave Laboratory (PPML)

PPML uses powerful electromagnetic pulses to generate plasmas and charged particle beams. The lab features three premier pulsed power facilities: MELBA, MAIZE, and BLUE. These machines produce momentary bursts of electrical power (hundreds of billions of watts) to study high-power electromagnetic phenomena. Areas of interest include nuclear fusion, extreme material states, and extreme radiation generation (x-rays, neutrons, and high-power microwaves). Lab research efforts include experiment, theory, and computation. Website: plasmabay.engin.umich.edu

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/nuclear -derived space propulsion, environmental hazard mitigation (water treatment, surface sterilization, sanitation, and plasma-based plastics waste treatment—both depolymerization and decomposition), and basic plasma science, such as self-organization and the mysteries of the plasma liquid interface. Particular attention is paid to those applications that protect the environment and those that improve the quality of life in underdeveloped countries. Here, research focuses on using plasmas to achieve sustainability and reuse of resources here on Earth —the resulting technologies have applications in space exploration as well, supporting in situ resource utilization. The laboratory houses a number of vacuum tanks and associated power systems such as DC, rf, and microwave power sources for plasma production. Advanced laser diagnostics are also used to probe fields and particles in the plasmas under test. Website: pstlab.engin.umich.edu

Position-Sensing Semiconductor Radiation Detector Laboratory

The Position-Sensing Semiconductor Radiation Detector Laboratory is dedicated to the development of room-temperature semiconductor radiation detectors. These instruments are being developed for applications in nuclear nonproliferation, homeland security, astrophysics, planetary sciences, medical imaging, and high-energy physics experiments. This lab is home to the Orion Radiation Measurement Group.

Website: cztlab.engin.umich.edu

Radiological Health Engineering (RHE) Laboratory

The RHE is a Radiation Detection and Protection MakerSpace, and, as such, includes equipment, radioactive sources, 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 measurement methods deployable within the immediate future. Equipment includes temporal radon measurement instruments, a variety of payload-capable drones, thermoluminescent and optically luminescent dosimetry systems, a high-volume, extremely sensitive gamma-ray spectroscopic system for environmental samples, and several augmented and virtual reality headsets. Much research in this laboratory is conducted by undergraduate teams, who have developed a radiation detection game, a build-your-own Geiger counter, and a radiation weather station suitable for STEM outreach. Website: rhelab.engin.umich.edu

Thermal Hydraulics Laboratory (THL)

The THL carries out separate-effect and integral-effects tests in reactor thermal hydraulics to support the safe and economical operation of light water reactors (LWRs) and development of advanced non-LWR reactors, including molten salt reactors and high-temperature gas-cooled reactors. It has established a number of high-temperature test facilities, including molten salt and helium test facilities, to understand key physical phenomena and develop experimental data for validation of safety analysis and computational fluid dynamics models.

Z Lab

The Z Lab's research can be summarized into two words: Matter and Machine. In the realm of Matter, they synergistically integrate statistical mechanics and molecular fluid mechanics theories, accelerated molecular simulations, understandable AI methods, and neutron scattering experiments to extend our understanding of rare events and long timescale phenomena in complex material systems. Particular emphasis is placed on the physics and chemistry of liquids and complex fluids, especially at interfaces, under extreme conditions, or when driven away from equilibrium. Concurrently, on the Machine front, leveraging their expertise in materials and modeling, they advance the development of soft robots and human-compatible machines, swarm robots and collective intelligence, and robots in extreme environments. These two research areas, spanning from fundamental to applied, serve as integral pillars in our overarching mission to foster a sustainable, resilient, and secure energy infrastructure.

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	7/24 - 6/25	7/25 - 6/26
Masters		
Ph.D.		

Number of Graduates

Graduate Student Enrollment: Masters/ Ph.D.
Graduate Certificates in Nuclear Criticality Safety & Nuclear Safeguards and Security.

Nuclear Science and Engineering Faculty

Alexander Barzilov, Professor (702-895-4325) [alexander.barzilov@unlv.edu] Ph.D., Institute for Physics and Power Engineering, 1997. Radiation detection; gamma spectroscopy; remote sensing of radiation using aerial and ground robotic platforms; active and passive assay of radiological materials; reactor physics. Website: <http://www.unlv.edu/people/alexander-barzilov>

Yitung Chen, Professor (702-895-1202) [yitung.chen@unlv.edu] Ph.D., University of Utah, 1991. Thermal-hydraulic with neutronics on MSR and PWR; nuclear thermal propulsion reactors

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Thomas Hartmann, Instructor (702-895-1934) [thomas.hartmann@unlv.edu] Ph.D., University Heidelberg / Karlsruhe Institute of Technology (Germany). Nuclear waste forms; advanced nuclear fuels; x-ray crystallography; solid phase analysis. Website: <https://www.unlv.edu/me>

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**No revisions or updates have been submitted at this time*

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CEAB Accreditation BScE

Nuclear Science and Engineering Faculty

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Olga Y. Palazhchenko, Associate Professor (506-453-4540) [olga.palazhchenko@unb.ca] Ph.D., University of New Brunswick, 2017. Simulation & modelling; reactor chemistry & corrosion; ion-exchange processes.

Nuclear Science and Engineering Research Centers

Center for Nuclear Energy Research (CNER): University Research Institute specializing in test systems that simulate reactor coolant systems for chemistry and corrosion studies and experiments.

Website: www.unb.ca/research/cner

**No revisions or updates have been submitted at this time*

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	7/24-6/25	7/25-6/26
B.S.	11	22
Masters	9	10
Ph.D.	4	11

Number of Graduates

Graduate Student Enrollment: 16 Masters/ 40 Ph.D.

ABET Accreditation: Bachelor of Science (BS) Degree in Chemistry and Nuclear Engineering

Distance Education Program

Offers Nuclear Engineering Courses Online ne.unm.edu

Nuclear Science and Engineering Faculty

Marek Flaska, Department Head and Professor of Nuclear Engineering (505-277-4600) [mflaska@unm.edu] Ph.D. Applied Physics, Delft University of Technology, 2006. Detection of neutrons, gamma rays and x-rays for nuclear nonproliferation, safeguards, and forensics; radiation imaging; data-acquisition and data-processing electronics; fundamental nuclear physics.

Website: <https://ne.unm.edu/faculty-staff/faculty-profiles/marek-flaska.html>

Osman Anderoglu, Associate Professor (505-277-0667) [oanderoglu@unm.edu] Ph.D., Texas A&M University, 2010. Development, testing, and qualification of advanced alloys for extreme environments; Two forced convection loops to study heavy liquid metal coolant (Pb, PbLi)- structural materials compatibility, instrumentation, heat exchangers, MHD phenomena, etc; advanced manufacturing for nuclear applications; remote mechanical testing capability of radioactive materials in a hot cell, mechanical testing capability at cryogenic temperatures and in molten Pb and Pb alloys. In-situ bulk/micro mechanical test in an SEM at elevated temperatures and in molten salt, Pb and Pb alloys. Extreme Materials group

Website: <https://anderoglu.unm.edu>

Minghui Chen, Assistant Professor (505-277-1941) [mnu@unm.edu] Ph.D., University of Michigan, 2018. Nuclear reactor thermal hydraulics and safety; High-temperature thermal-fluid systems (molten salt, sCO₂, liquid metal, helium); Innovative heat exchanger design, optimization, modeling, and testing; Advanced thermal power cycles and thermal energy storage; and Molten Salt Reactors, Sodium-cooled Fast Reactors, High-Temperature Gas-cooled Reactors, Concentrated Solar Power, and Micro-Reactors. Website: <https://www.thermalhydraulic.com/>

Mohamed S. El-Genk, Distinguished and Regents' Professor (505-277-5442) [mgenk@unm.edu] Ph.D., The University of New Mexico, 1981. Space nuclear power systems and Nuclear Thermal Propulsion; Small and micro reactors' design and analyses; Nuclear reactors' thermal hydraulics; CFD analyses and applications to gas, liquid metals and water-cooled reactors and complex energy systems; radiation shielding of ionized space energetic particles; high and low temperature heat pipes and applications to nuclear reactor, energy systems and waste heat rejection for space nuclear reactor power systems; nuclear fuel and high temperature materials; static and dynamic energy conversion and applications; nuclear reactor plants' cybersecurity; boiling heat transfer and two-phase flow; nuclear reactors' kinetics and control. Website: <https://isnps.unm.edu/>

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Eric Lang, Assistant Professor (505-277-0772) [ejlang2@unm.edu] Ph.D., University of Illinois - Urbana Champaign, 2020. Nuclear materials; irradiation damage; fusion materials; materials characterization. Website: <https://www.unm-charisma-lab.com/>

Hyoung K Lee, Professor (505-277-0686) [leehk@unm.edu] Ph.D., University of California at Berkeley, 1995. Radiation detection; nuclear imaging; nuclear nonproliferation. Christopher Perfetti, Associate Professor (505-277-1945) [cperfetti@unm.edu] Ph.D., University of Michigan, 2012. Nuclear reactor physics; radiation transport; nuclear criticality safety; Monte Carlo methods; sensitivity and uncertainty analysis. Website: <https://ne.unm.edu/faculty-staff/faculty-profiles/christopher-perfetti.html>

Other Faculty

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

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

Anil K. Prinja, Distinguished Professor Emeritus (505-277-5431) [prinja@umn.edu] Ph.D., Queen Mary College, University of London, U.K., 1980. Stochastic Particle Population Modeling; Radiation Transport in Stochastic Media; Charged Particle Transport.

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.

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	7/24-6/25	7/25-6/26
Masters	2	1

Graduate Student Enrollment: 26 Masters
ABET Accreditation: Mechanical Engineering, Materials Science and Engineering

Distance Education Program
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Nuclear Science and Engineering Faculty

Heng Ban, Director of Nuclear Engineering, and Interim Associate Dean for Research and Facilities and Richard K. Mellon Professor, (412-624-0325) [heng.ban@pitt.edu] Ph.D., University of Kentucky, 1994. Thermal properties and measurement techniques for nuclear materials, transient fuel performance, sensor development for in-pile applications. Professional Engineer.

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

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Jorg Wiezorek, 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

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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.

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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.

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	7/24-6/25	7/25-6/24
Masters	5	4
Ph.D.	2	0

Number of Graduates

Graduate Student Enrollment: 15 Masters/ 8 Ph.D.

Distance Education Program

Offers Nuclear Engineering Courses and Degrees Online

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Theodore M. Besmann, Professor and Endowed Chair in the General Atomics Center (803-777-9853) [besmann@cec.sc.edu] Ph.D., Pennsylvania State University, 1976. Nuclear fuels, materials, high temperature behavior, thermodynamics, ceramic composites, energy policy. Website: https://sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/besmann_theodore.php

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Fanglin (Frank) Chen, Professor (803-777-4875) [chenfa@cec.sc.edu] Ph.D., Georgia Institute of Technology, 2001. Advanced ceramic materials for nuclear related applications; Porous and dense membranes for gas transport and separation; Tritium separation and sequestration. Website: http://sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/chen_frank.php

Frederick L. Dryer, Distinguished Research Professor in Mechanical Engineering (609-306-1028) [DryerF@mailbox.sc.edu] Ph.D., Princeton University, 1972. Thermal sciences (heat transfer, fluid dynamics, physical chemistry, chemical kinetics); petroleum and alternative fuels; propulsion concepts and propellants; chemical kinetics in energy conversion and processing. Website: https://sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/dryer.php

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Andrew J. Gross, Assistant Professor (803-777-0183) [andrewgross@sc.edu] Ph.D., The University of Texas at Austin, 2015. Solid mechanics; fracture mechanics; experimental mechanics; material property inference; thermomechanical property homogenization. Website: <https://andrewjgross.com>

Ruixian Fang, Research Associate Professor (803-777-7193) [fangr@cec.sc.edu] Ph.D., University of South Carolina, 2011. Thermal-hydraulic safety analysis of advanced small modular reactors; predictive modeling and sensitivity/uncertainty methods for nuclear systems; heat transfer and fluid flow with phase change; applied CFD; multiphysics coupled modeling. Website: https://sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/fang_ruixian.php

Ming Hu, Professor (803-576-7206) [hu@sc.edu] Dr.-Ing., Chinese Academy of Sciences, 2007. Artificial intelligence; machine learning; materials science; materials development; atomistic simulations; modeling. Website: <https://hu-lab.mystrikingly.com/>

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Ph.D., National Polytechnic Institute of Toulouse, 2020.
Materials; chemical thermodynamics; nuclear fuels; molten salts; experimental physical chemistry.
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Michael Sutton, Professor (803-777-7158) [sutton@sc.edu] Ph.D., University of Illinois, Champaign- Urbana, 1981. National Academy of Engineering, 2020. Fracture; fatigue; vision-based measurements; experimental solid mechanics; biomechanics; composite and metallic material characterization. Website: https://sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/sutton_michael.php

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Other Faculty

Ruixian Fang, Research Associate Professor (803-777-7193) [fangr@cec.sc.edu] Ph.D., University of South Carolina, 2011. Thermal-hydraulic safety analysis of advanced small modular reactors; Predictive modeling, sensitivity/uncertainty method for critical/subcritical nuclear systems; Heat transfer and fluid flow with phase changes; Applied Computational Fluid Dynamic (CFD); System-level thermal modeling and simulation.
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Luther L Hamm, Adjunct Professor (803-725-2520) [luther.hamm@srnl.gov] Ph.D., USC, 1982. Subsurface contaminant transport within the environment. Thermal hydraulic design and analysis of nuclear reactors.

Mark W. Pérès, Adjunct Professor (509-430-2566) [peresm@email.sc.edu] M.S., Washington State University, 1999. Advanced Gen IV and Gen III+ small modular reactor and microreactor design, licensing and operations; Repowering coal-fired power plants and powering data centers with small nuclear reactors; Nuclear Project Management and Engineering Quality Assurance. Website: https://www.sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/mark_peres.php

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: https://sc.edu/study/colleges_schools/engineering_and_computing/faculty-staff/roberts_elwyn.php

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

Nuclear Science and Engineering Research Centers

USC Nuclear Materials Laboratory: USC Nuclear Materials Laboratory: The Nuclear Materials Laboratory at the University of South Carolina is licensed and has the necessary equipment for processing, handling, testing, and characterizing radioactive and pyrophoric materials and has a large amount of experience with uranium- and thorium-based materials. The lab includes two chemical hoods, two radiological hoods, two walk-in radiological hoods, and two inert atmosphere gloveboxes. General metallographic and sample preparation capability is available. Relevant equipment includes high temperature furnaces, analytical balances, presses, ball mill, mercury porosimeter (Quantachrome), helium pycnometer (Micromeritics), inductively coupled plasma-optical emission spectrometric analyzer (Perkin Elmer Avio-200) and fusion oxygen and hydrogen analyzer (Elementrac OH-p2). Simultaneous thermal analysis (TGA, DSC) (Netzsch STA409CD) and two differential scanning calorimeters (Netzsch DSC404DSC and Calvet Pro 830), all used in thermochemical studies of nuclear fuels and materials. Electrical resistivity of samples can be measured using a Cascade Microtech C4S-47/00 four-point probe tip and used in conjunction with a Gamry Reference 600 potentiostat. Hardness testing is done using a Buehler Micromet-1 microhardness tester with diamond indenter. The Electron Microscopy Center (EMC) and X-ray Diffraction Laboratory at the University of South Carolina are available user facilities capable of handling radioactive materials using existing protocols.

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.

Laboratory for Spent Fuel Storage and Handling: The laboratory is equipped with capabilities to test and evaluate the processing, handling and storage of simulated spent fuel with testing conducted on zirconium and aluminum clad fuels. A large vacuum chamber is equipped with instruments for pressure, temperature, relative humidity, optical emission spectroscopy, and thermal imaging. A full scale BWR fuel assembly is installed in the chamber and contains depleted uranium rods along with 12 heater rods used to simulate decay heat of fuel assemblies. A vacuum and gas recirculation network connected to the chamber is capable of simulating vacuum drying and forced circulation drying of nuclear fuel assemblies. A medium sized chamber is equipped for tests involving mock research reactor fuels which have been fabricated from aluminum plates and decay heat is simulated through resistance heaters. A smaller chamber is similarly equipped for testing at a smaller scale. The equipment is used for drying, corrosion, environmental, and mechanical testing related to spent fuel handling and storage and in particular dry cask storage. The chambers and equipment are also used as a testbed for sensors developed for structural health monitoring of storage canisters. Other work includes the study of wireless sensors for measuring temperature, pressure, and gas composition without cask penetrations.

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	7/24-6/25	7/25-6/26
B.S.	40	43
Masters	38	31
Ph.D.	12	31

Number of Graduates

Graduate Student Enrollment: 25 Masters/ 146 Ph.D.

ABET Accreditation:
Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Science and Engineering Faculty

Brian D. Wirth, Tennessee Valley Authority Department Head of Nuclear Engineering; UTK-ORNL Governor's Chair Professor of Computational Nuclear Engineering (865-974-2525) [bdwirth@utk.edu] Ph.D., University of California, Santa Barbara, 1998. Computational modeling and measurements of radiation effects in materials; molecular dynamics simulation; nano-materials.
Website: <https://ne.utk.edu/people/brian-d-wirth/>

Rigoberto Advincula, UT-ORNL Governor's Chair of Advanced and Nanostructured Materials (865-241-9060) [radvincu@utk.edu] Ph.D., The University of Florida, 1994. Polymers; nanoscience; macromolecular engineering; hybrid materials; ultrathin films; radiopharmaceutical ligands; separations; high-throughput manufacturing; AI/ML-driven reaction engineering; 3D-printed phantom materials; scintillation materials; polymer materials for radiation shielding. Website: <https://research.utk.edu/govchairs/rigoberto-advincula/>

Kondapa Naidu Bobba, Assistant Professor (865-974-2525) [kbobba@utk.edu] Ph.D., Amrita Vishwa Vidyapeetham, 2018. Molecular imaging and radiotheranostics; fluorescent probes; medicinal chemistry. Website: <https://ne.utk.edu/people/kondapa-naidu-bobba>

Sandra Bogetic, Assistant Professor (865-974-2525) [sbogetic@utk.edu] Ph.D., University of California, Berkeley, 2020. Numerical methods in reactor core analysis; neutron beam tailoring; high-performance computing; BNCT; nuclear security and nonproliferation. Website: <https://ne.utk.edu/people/sandra-bogetic/>

Nicholas Brown, Professor and Pietro F. Pasqua Fellow (865-974-2525) [nbrown49@utk.edu] Ph.D., Purdue University, 2011. Reactor safety; transient simulation; advanced fuel and cladding materials; sustainable fuel cycles. Website: <https://ne.utk.edu/people/nicholas-brown/>

Livia Casali, Assistant Professor and Zinkle Fellow (865-974-2525) [lcasali@utk.edu] Ph.D., Max Planck Institute for Plasma Physics / LMU Munich, 2015. Fusion energy science; plasma physics; divertor optimization; impurity transport; core-edge integration for high-performance fusion scenarios. Website: <https://ne.utk.edu/people/livia-casali/>

Sarah Donaher, Assistant Professor (865-974-7601) [sdonaher@utk.edu] Ph.D., Clemson University, 2024. Pollutant mobility and ecotoxicity; radioactive and emerging contaminants; emergency response and decommissioning; environmental management; engineering education. Website: <https://ne.utk.edu/people/sarah-donaher/>

David Donovan, Professor and Zinkle Fellow (865-974-2525) [ddonovan@utk.edu] Ph.D., University of Wisconsin–Madison, 2011. Fusion technology; boundary plasma physics; plasma diagnostics; plasma -material interactions; fusion neutron generators. Website: [https://ne.utk.edu/people/david -c-donovan/](https://ne.utk.edu/people/david-c-donovan/)

Howard L. Hall, Professor (865-974-2525) [hhall6@utk.edu] Ph.D., University of California, Berkeley, 1989. Nuclear security; proliferation detection; radiological threat response; nuclear forensics; radiochemistry; explosives detection. Website: <https://ne.utk.edu/people/howard -l-hall/>

Khalid Hattar, Director of the Tennessee Ion Beam Materials Laboratory and Associate Professor (865-974-0679) [khattar@utk.edu] Ph.D., University of Illinois at Urbana-Champaign, 2009. Microstructure response under extreme conditions; in-situ electron microscopy; ion-beam modification; nanostructured materials. Website: <https://ibml.utk.edu/>

Jason P. Hayward, Professor and UCOR Fellow (865-974-2525) [jhayward@utk.edu] Ph.D., University of Michigan, 2008. Radiation detection; nuclear security; safeguards; nuclear instrumentation; medical and health physics. Website: <https://radideas.utk.edu/>

Lawrence H. Heilbronn, John D. Tickle Professor (865-974-2525) [lheilbro@utk.edu] Ph.D., Michigan State University, 1991. High-energy neutron production from heavy-ion interactions. Website: <https://ne.utk.edu/people/lawrence-h-heilbronn/>

J. Wesley Hines, Emeritus Chancellor's Professor (865-974-2525) [jhines2@utk.edu] Ph.D., Ohio State University, 1994. Diagnostics and surveillance; AI methods; expert systems; neural networks. Website: <https://ne.utk.edu/people/j-wesley-hines/>

Michael Howard, Medical Physics Program Director (865-974-2525) [mhowar14@vols.utk.edu] Ph.D., University of Tennessee, 2012. Clinical applications of medical physics. Website: <https://ne.utk.edu/people/michael-howard/>

Alexandre Ivanov, Assistant Professor and Early Career Faculty Fellow (865-974-2525) [aivanov@utk.edu] Ph.D., Utah State University, 2015. Molten salts under reactor extremes; actinide-lanthanide separations; radionuclide theranostics. Website: <https://ne.utk.edu/people/alex-ivanov/>

Maik K. Lang, Professor and Pietro F. Pasqua Fellow (865-974-2525) [mlang2@utk.edu] Ph.D., University of Heidelberg, 2004. Radiation damage; high-pressure materials studies; materials science. Website: <https://dismat.utk.edu/>

Eric D. Lukosi, Charles P. Postelle Professor in Nuclear Engineering (865-974-2525) [elukosi@utk.edu] Ph.D., University of Missouri, 2012. Neutron detection; dosimetry; nuclear batteries; applied plasma physics; nuclear physics; cross-section evaluations. Website: <https://ne.utk.edu/people/eric-d-lukosi/>

G. Ivan Maldonado, Associate Department Head and Professor (865-974-2525) [ivan.maldonado@utk.edu] Ph.D., North Carolina State University, 1993. In-core fuel management; fuel cycle analysis; advanced reactors. Website: <https://ne.utk.edu/people/g-ivan-maldonado/>

Ilja Popovs, Associate Professor and Pietro F. Pasqua Faculty Fellow (865-974-2525) [ipopovs@utk.edu] Ph.D., University of Houston, 2014. f-element chemistry; chelators for alpha therapy; separations; smart membranes; critical-materials recovery; metal-ligand interaction studies. Website: <https://ne.utk.edu/people/ilja-popovs/>

Vladimir Sobes, Associate Professor and Charles P. Postelle Professor in Nuclear Engineering (865-974-2525) [sobesv@utk.edu] Ph.D., Massachusetts Institute of Technology, 2013. Nuclear data; methods and code development; criticality safety; AI for advanced design. Website: <https://ne.utk.edu/people/vladimir-sobes/>

Daniel Suarez, Teaching Associate Professor (865-974-2525) [daniel.suarez@utk.edu] Ph.D., Polytechnical University of Catalonia, 2023. Nuclear safety; reactor operations; thermal-hydraulics; accident analysis; licensing; numerical methods; fusion systems; breeding blankets; plasma-facing components.

Mackenzie Warwick, Teaching Assistant Professor (865-974-2525) [mwarwic2@utk.edu] Ph.D., University of Michigan, 2025. Nuclear and radiological engineering education; materials science; radiation detection; system design; nuclear waste management; ion beam analysis; societal impacts of nuclear accidents.

Xianfei Wen, Research Assistant Professor (865-974-2525) [xwen5@utk.edu] Ph.D., Oregon State University, 2016. Active interrogation; neutron scattering instrumentation; neutron imaging; radioactive waste characterization; decommissioning. Website: <https://ne.utk.edu/people/xianfei-wen/>

Xingang Zhao, Assistant Professor (865-974-2525) [xzha047@utk.edu] Ph.D., Massachusetts Institute of Technology, 2019. Computational thermal hydraulics; prognostics and health management; autonomous control; safety and reliability; AI/ML; digital twins; uncertainty quantification; hybrid energy systems. Website: <https://ne.utk.edu/people/xingang-zhao/>

Steven Zinkle, UTK-ORNL Governor's Chair Professor for Nuclear Materials (865-974-4589) [szinkle@utk.edu] Ph.D., University of Wisconsin-Madison, 1985. Physical metallurgy; ion and neutron irradiation effects; TEM; fusion and space fission materials. Website: <https://zrg.utk.edu/>

Ronald E. Pevey, Professor of Practice (865-974-2525) [rpevey@utk.edu] Ph.D., University of Tennessee, Knoxville, 1982. Reactor physics; thermal hydraulics; computer methods; shielding; criticality safety. Website: <https://ne.utk.edu/people/ronald-e-pevey/>

H. L. Dodds, IBM Professor (865-974-2525) [utne@utk.edu] Ph.D., University of Tennessee, year N/A. Reactor core analysis; transient modeling; reactor safety; advanced reactors; criticality safety; energy policy.

John T. Mihalcz, Professor (865-974-2525) [maccat15@comcast.net] Ph.D., University of Tennessee, Knoxville, year N/A. Radiation measurements for safeguards; criticality safety; reactor physics.

Laurence F. Miller, Professor Emeritus (865-974-2525) [lfmiller@utk.edu] Ph.D., Texas A&M University, 1976. Particle and radiation transport; diagnostics; waste management; health physics; modeling and simulation; instrumentation and control. Website: <https://ne.utk.edu/people/laurence-f-miller/>

Luis Stand Stracuzzi, Research Assistant Professor (865-974-0267) [lstand@vols.utk.edu] Ph.D., University of Tennessee, Knoxville, 2018. Advanced crystal growth techniques; high-performance scintillator materials; rapid compound screening. Website: <https://ne.utk.edu/people/luis-stand-stracuzzi/>

Other Faculty

Sopie Blondel, Research Assistant Professor (865-974-2525) [sblondel@utk.edu] Ph.D., Paris-Sud University, Orsay, France, 2013. Continuum-scale models for irradiated materials; high-performance computing applications.

Ondrej Chvala, Research Assistant Professor (865-974-2525) [ochvala@utk.edu] Ph.D., Charles University in Prague, 2007. High-performance computing for nuclear engineering; reactor core physics; molten -salt systems. Website: <https://ne.utk.edu/people/ondrej-chvala/>

Charles L. Melcher, Research Professor (865-974-0254) [cmelcher@utk.edu] Ph.D., Washington State University, year unknown. Scintillation materials discovery; luminescent materials; detector development; medical imaging; homeland security; crystal growth. Website: <https://ne.utk.edu/people/charles-l-melcher/>

Jun Ren, Research Assistant Professor (865-974-2525) [rjun@utk.edu] Ph.D., Institute of Plasma Physics, Chinese Academy of Sciences, 2016. Boundary diagnostics; divertor heat flux; fusion device performance; plasma-surface interaction; wall conditioning. Website: <https://ne.utk.edu/people/jun-ren/>

Lawrence W. Townsend, Chancellor's Professor and Robert M. Condra Professor Emeritus (865-974-2525) [ltownsen@utk.edu] Ph.D., University of Idaho, 1980. Radiation physics; transport; shielding; risk assessment; theoretical nuclear physics. Website: <https://ne.utk.edu/people/lawrence-w-townsend/>

Belle R. Upadhyaya, Professor Emeritus (865-974-2525) [bupadhya@utk.edu] Ph.D., University of California, San Diego, year N/A. Dynamics; instrumentation and control; diagnostics; next -generation reactors; autonomous space reactors; nondestructive examination; reliability engineering. Website: <https://ne.utk.edu/people/belle-r-upadhyaya/>

The UNIVERSITY OF TEXAS at AUSTIN

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	7/24-6/25	7/25-6/26
Masters	6	8
Ph.D.	10	12

Number of Graduates

Graduate Student Enrollment: 54 PhD/12 MS
ABET Accreditation: BS in Mechanical Engineering

Distance Education Program
Nuclear Engineering Courses for MS and PhD Degrees
<https://nuclear.engr.utexas.edu/academics/distance-learning-training>

Nuclear Science and Engineering Faculty

William Charlton, Director, Nuclear Engineering Teaching Laboratory and John J. McKetta Energy Professor [wcharlton@austin.utexas.edu] Ph.D., Texas A&M University, 1999. Nuclear security, forensics, and nonproliferation; nuclear detection; reactor physics; radiation interaction with matter; radioisotope production.

Website: <http://www.me.utexas.edu/people/faculty-directory/charlton>

Kevin Clarno, Associate Professor, Charlotte Maer Patton Centennial Fellowship in Engineering [clarino@utexas.edu] Ph.D., Texas A&M University, 2002. Multiphysics coupling methods, neutronics; fuel performance; design, optimization, analysis of advanced commercial and test reactor concepts, digital twins. Website: <http://www.me.utexas.edu/people/faculty-directory/clarno>

Derek Haas, Associate Professor, Chevron Centennial Fellowship in Engineering #2 [derekhaas@utexas.edu] Ph.D., University of Texas at Austin, 2008. Radiation detection for nuclear arms control and non-proliferation; fundamental physics of radioactive decay processes; detection techniques; design and licensing of advanced reactors; digital twins.

Website: <http://www.me.utexas.edu/people/faculty-directory/haas>

Dale Klein, Professor Emeritus, Frank and Kay Reese Endowed Professorship in Engineering [dale.klein@utexas.edu] Ph.D., University of Missouri-Columbia, 1977. Nuclear power sustainability, nuclear regulations; nuclear nonproliferation.

Website: <http://www.me.utexas.edu/people/faculty-directory/klein>

Sheldon Landsberger, Professor Robert B. Trull Chair in Engineering [s.landsberger@mail.utexas.edu] Ph.D., University of Toronto, 1982. Nuclear Instrumentation; nuclear forensics.

Website: <https://www.me.utexas.edu/people/faculty-directory/landsberger>

Mitch Pryor; Research Professor [mpryor@utexas.edu] Ph.D., University of Texas, Austin, 2002. Robotics hazardous areas with special nuclear materials; design; controls, decision making.

Website: <https://robotics.me.utexas.edu/people>

Elena Zannoni, Assistant Professor [elena.zannoni@austin.utexas.edu] Ph.D. University of Illinois, 2021. Development of nuclear medicine imaging instrumentation and data analysis techniques for advanced applications in radiological science and molecular imaging.

Website: <https://www.me.utexas.edu/people/faculty-directory/zannoni>

Other Faculty and Researchers

Robert Blake Anderson, Research Scientist [blakeanderson@utexas.edu] Ph.D., The University of Texas at Austin, 2020. Mobile robotic systems; autonomous radiation surveying; radioactive source localization; optimization of rob measurements; robot task planning.

Benjamin Collins, Senior Research Fellow [collins.bs@gmail.com] Ph.D., University of Michigan, 2011. Computational nuclear engineering, digital twin reactors.

Ondrej Chavla, Senior Research Fellow [ochvala@utexas.edu] Ph.D., Institute of Particle and Nuclear Physics Charles University in Prague, Czech Republic, 2007. Computational nuclear engineering.

Will Flanagan, Research Scientist [will.flanagan@austin.utexas.edu] Ph.D., Texas A&M University, 2014. Experimental nuclear physics, nuclear data, radiation detection, radiation effects in materials.

Cole Gentry, Senior Engineering Scientist [cole.gentry@austin.utexas.edu] Ph.D., University of Tennessee - Knoxville, 2015. Nuclear engineering.

Desiderio Kovar, Professor, The BFGoodrich Endowed Professorship in Materials Engineering, Distinguished Teaching Professor, Materials Science and Engineering, [dekovar@austin.utexas.edu] Ph.D. Carnegie Mellon University, 1995, Microstructure/property relationships in ceramics; metals, composites; additive manufacturing. Website: <https://www.me.utexas.edu/faculty/faculty-directory/kovar>

Joseph Lapka, Research Associate [joseph.lapka@austin.utexas.edu] Ph.D., Oregon State University, 2013; Nuclear fuel reprocessing; actinide and lanthanide chemistry, aqueous and organic solution chemistry. Nicholas Luciano: Senior Engineering Scientist [nicholas.luciano@austin.utexas.edu] MS, University of Tennessee - Knoxville, 2012. Nuclear engineering.

Don Nolting, Research Scientist [don.nolting@austin.utexas.edu] Ph.D., University of Iowa, 2005; Chemistry, Nuclear Chemistry, Isotope Production, NMR & MRI, Spectroscopy, and Preclinical Cancer Research.

Shayan Shahbazi, Senior Research Fellow [shayan.shahbazi@austin.utexas.edu] Ph.D., University of Tennessee - Knoxville, 2018; Nuclear engineering, chemical engineering, and radiochemistry, especially for molten salt reactors.

Nuclear Science and Engineering Research Centers

Nuclear Engineering Teaching Laboratory (NETL): The J.J. Pickle Research Campus, a separate research center of the University of Texas, features a 1.1 Megawatt TRIGA reactor. Areas of study include health physics, radiation engineering, research reactor beam port experiments, environmental radioactive waste management, reactor and computational nuclear engineering, and nuclear forensics. NETL also houses a 14 MeV neutron generator, 2 Pu(Be) sources, two Compton suppressed germanium system, gamma-gamma coincidence, prompt gamma activation analysis, neutron radiography, radiochemistry and neutron activation analysis laboratories and other multiple detectors.

Translational Radiological Advanced Imaging Laboratory (TRAIL): Research efforts focus on the development of nuclear medicine imaging instrumentation and data analysis techniques for advanced clinical and preclinical applications in radiological science and molecular imaging.

Nuclear and Applied Robotics Laboratory: Advanced research in efforts to deploy robotics in hazardous, uncertain environments to perform manufacturing and special nuclear material handling.

Digital Molten Salt Reactor Initiative: Demonstrating practical application of digital twins (DTs) for nuclear/molten salt systems to understand and communicate a vision for how DTs will be used for enabling licensing of technological advances in advanced reactors.

UNIVERSITY OF UTAH

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	7/24-6/25	7/25-6/26
Masters	7	2
Ph.D.	5	3

Number of Graduates

Graduate Student Enrollment: 5 Masters/ 10 Ph.D.
ABET Accreditation: Civil Engineering

Nuclear Science and Engineering Faculty

Andrew Allison, Reactor Supervisor (801-581-4188) [andrew.allison@utah.edu] M.S., University of Utah, 2024. Nuclear Reactor Operations; Nuclear Regulations.

Darryl Butt, Professor [darryl.butt@utah.edu] Ph.D., Pennsylvania State University, 1991. Nuclear materials; advanced manufacturing; ceramics and materials processing; critical materials; energy -related materials research. Website: <https://faculty.utah.edu/u0034355>

Edward Cazalas, Assistant Professor (801-581-7397) [edward.cazalas@utah.edu] Ph.D., Pennsylvania State University, 2015. Radiation detection; radiation effects; instrumentation and electronics.

Ted Goodell, Nuclear Reactor Lab Director, (801-581-4188) [ted.goodell@utah.edu] Ph.D., University of Utah, 2025. SRO, Research Reactor Operations and Maintenance, Reactor Operator Training

Tara Mastren, Associate Professor (801-581-7277) [tara.mastren@utah.edu] Ph.D., Washington University in St. Louis, 2014. Radiochemistry; Nuclear Medicine; Lanthanide and Actinide Separations; Neutron Activation Analysis. Website: <https://themastrenlab.sitey.me/>

Kody Powell, Associate Professor (801-581-6950) [kody.powell@utah.edu] Ph.D., University of Texas at Austin, 2013. Dynamic Energy Systems Modeling; Nuclear Hybrid Energy Systems; Technoeconomic Analysis; AI Modeling and Optimization of Energy Systems. Website: www.kodypowell.che.utah.edu

Supathorn Phongikaroon, Professor & UNEP Director (801-581-8874) [sphongikaroon@utah.edu] Ph.D., University of Maryland, College Park, 2001. Pyroprocessing; Molten Salt Radiochemistry; Laser Spectroscopy. Website: <https://profiles.faculty.utah.edu/u6067491>

Michael Simpson, Professor [michael.simpson@utah.edu] Ph.D., Princeton University, 1996; nuclear materials; pyroprocessing; electrochemistry; materials characterization; advanced manufacturing for nuclear energy applications. Website: <https://profiles.faculty.utah.edu/u0907827>

Vince Wang, Assistant Professor [vince.wang@utah.edu] Ph.D., Virginia Tech, 2019. Particle Transport Simulation; Multi-Physics Coupling; Reactor Digital-Twin development. Website: <https://profiles.faculty.utah.edu/u6028569>

US MILITARY ACADEMY

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	7/24-6/25	7/25-6/26
BS	25	20
MS	0	0
Ph.D.	0	0

Number of Graduates

ABET Accreditation: Bachelor of Science (BS) Degree in Nuclear Engineering

Nuclear Science and Engineering Faculty

Dr. Kenneth S. Allen, Professor and Deputy Department Head, Nuclear Engineering Program Director, (845-938-3014) [Kenneth.allen@westpoint.edu] Ph.D., University of South Carolina, 2011. Computational Design of Nuclear Systems, MCNP, SCALE, microreactors for Army Ground Operations, alpha- voltaic cells for low-voltage power sources, radiation waste transmutation and management.

Dr. Joseph L. Bottini, Assistant Professor (845-938-4787) [joseph.bottini@westpoint.edu] Ph.D., University of Illinois at Urbana-Champaign, 2022. Experimental thermal hydraulics, multiphase flow, Two-Fluid Model, critical heat flux, microreactors. Website: https://www.westpoint.edu/physics-and-nuclear-engineering/profile/joseph_bottini

LTC Andrew W. Decker, Director of the DTRA Nuclear Science and Engineering Research Center (845-938-0093) [andrew.decker@westpoint.edu] Ph.D., University of Tennessee, Knoxville, 2021. Radiation detection, organic scintillators, dual particle radiography, MCNP, radiation protection factor research.

MAJ Josh Mashl, Senior Instructor (845-938-2439) [joshua.mashl@westpoint.edu] M.S., University of Michigan, 2020. Radiation detection and novel scintillators, shielding, modeling.

LTC Chris Matthew (845-938-8611) [christopher.matthew@westpoint.edu] M.S., Kansas State University, 2010. Active interrogation for explosives detection, nuclear weapons effects.

MAJ Dave Pert, Senior Instructor (845-938-2344) [dave.pert@westpoint.edu] M.S., Air Force Institute of Technology, 2024. Nuclear fuel cycle, novel scintillators, nuclear weapons effects.

LTC Jill Rahon, Assistant Professor, Research Program Director (845-709-1215) [jill.rahon@westpoint.edu] Ph.D., Massachusetts Institute of Technology, 2024. Radiation detection, protection, and shielding; neutron and mixed-field detection; health physics; radiography; nuclear resonance analysis; accelerators; nuclear materials assay; decontamination; radiological decommissioning and waste management.

LTC Andrew Wilhelm, Assistant Professor (845-938-0460) [andrew.wilhelm@westpoint.edu] Ph.D., University of Michigan, 2024. Opaque scintillators, gamma-ray and neutron spectroscopy, imaging, antineutrino detection, effects of nuclear reactors on battlefields.

US NAVAL ACADEMY

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mmmurray@usna.edu

	7/24-6/25	7/25-6/26
B.S.	17	19

Number of Graduates

ABET Accreditation: Nuclear Engineering

Nuclear Science and Engineering Faculty

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

Brian Earp, Assistant Professor and Permanent Military Professor (410-293-6432) [earp@usna.edu] Ph.D., Naval Post-Graduate School, 2020. Materials – Microscopy.

Elizabeth Getto, Associate Professor (410-293-6506) [getto@usna.edu] Ph.D., University of Michigan, 2016. Nuclear materials; Ion irradiation effects in materials; Reactor structural materials.

Joseph Latta, Assistant Professor (410-293-6537) [jlatta@usna.edu] Ph.D., Colorado School of Mines 2022 Radiation detector development; additive manufacturing; reactor plant design; radiation hardened electronics.

Stephen McHale, Associate Professor (410-293-6495) [mchale@usna.edu] Ph.D., Air Force Institute of Technology, 2011. Radiation transport and shielding; Nuclear weapons effects; Neutron imaging and activation analysis.

Angel F. Rodriguez, Assistant Professor (917-923-2345) [arodrigu@usna.edu] Ph.D., University of California, Berkeley, 2022. Fluids, Thermal Hydraulics, Multiphase Flows.

Other Faculty

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

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Graduate Student Enrollment: 87 MS / 48 PhD
ABET Accreditation: Mechanical Engineering

Nuclear Science and Engineering Faculty

Zhongquan “Charlie” Zheng, Department Head and Professor (435)797-2878 [zzheng@usu.edu] Ph.D. Old Dominion University, 1993. Vortex Dynamics, CFD, heat transfer, turbulent flow, aeroacoustics, and biofluid dynamics.

Srishti Banerji, Assistant Professor. (435)797-0990 [Srishti.banerji@usu.edu]. Ph.D. Michigan State University, 2021. Property characterization of high-performance and sustainable construction materials at room and high temperatures; performance-based structural design; non-destructive testing; structural health monitoring.

Ryan Berke, Associate Professor and Director of USU’s Thermal Hydraulics and Materials Properties (TMP) Center. (435)797-8184 [ryan.berke@usu.edu] Ph.D. Ohio State University, 2013. Experimental solid mechanics for extreme temperature environments, digital image correlation at high magnifications and long working distances, high-throughput mechanical testing. Websites: www.berkelab.com, nuclear.usu.edu

Som Dutta, Associate Professor. (435)797-0329 [som.dutta@usu.edu]. Ph.D. University of Illinois, Urbana-Champaign 2016. Computational fluid dynamics, multi-phase flow, particle flow.

Thomas Fronk, Associate Professor and Associate Dean of the College of Engineering. (435)797- 0116 [Thomas.fronk@usu.edu]. Ph.D. Virginia Tech, 1991. Composite structures, numerical solutions, finite elements, vibrations.

Nadia Kouraytem, Associate Professor. (435)797-6364. [nadia.kouraytem@usu.edu] Ph.D. King Abdullah University of Science and Technology (KAUST), 2016. Process-structure-property relationships of metal additive manufacturing techniques for applications in extreme environments.

Juhyeong Lee, Associate Professor. (435)797-0329. [juhyeong.lee@usu.edu] Ph.D. Mississippi State University, 2017. Damage mechanisms due to thermal-electrical-mechanical coupling, effects of lightning strikes on composites.

Nick Roberts, Associate Professor and Associate Department Head. (435)797-9455 [nick.roberts@usu.edu]. Ph.D. Vanderbilt University, 2010. Direct energy conversion and storage, materials, nanotechnology, thermal transport. Website: <http://ntel.go.usu.edu>

Barton Smith, Professor. (435)797-8147 [barton.smith@usu.edu]. Ph.D. Georgia Tech, 1999. Experimental fluid mechanics, validation benchmark simulations for CFD, particle image velocimetry uncertainty, flow control applied to materials processing.
Website: http://efdl.neng.usu.edu/EFDL/EFDL_Home.html

Dae Han Sung, Assistant Professor. (435)797-2952 [daehan.sung@usu.edu]. Ph.D. University of Delaware, 2023. Multiscale composite materials, nanocomposites, multifunctional applications, composite interface modification, polymer matrix composites, manufacturing/design/characterization.

Elizabeth Vargis, Associate Professor. (435)797-0618 [elizabeth.vargis@usu.edu]. Ph.D. Vanderbilt University, 2012. Health physics, tissue engineering, effects of radiation on cardiac and skeletal muscle. Website: www.vargislab.com

Hailei Wang, Associate Professor. (435)797-2098 [hailei.wang@usu.edu]. Ph.D. Oregon State University, 2006. Thermal fluid sciences, advanced energy systems, integration of waste heat and renewable energy, and high - performance micro-channel heat exchangers. Website: <http://mae.usu.edu/faculty/hailei-wang/index>

Haoran Wang, Assistant Professor. (435)797-0951 [haoran.wang@usu.edu] Ph.D. University of Illinois, Urbana-Champaign, 2017. Solid mechanics and materials, multiscale computations, uncertainty quantification, data-driven modeling. Website: <https://sites.google.com/site/haoranwangresearch/>

Ziyu Wang, Assistant Professor. (435)797-2294 [ziyu.wang@usu.edu]. Ph.D. Northeastern University, 2020. Combustion, propulsion systems, clean fuels, renewable energy.

Nuclear Science and Engineering Research Centers

Thermal Hydraulics and Materials Properties (TMP) Center: Dr. Ryan Berke, Director. Located 140 miles south of INL, USU has emerged to play a major role regionally in nuclear engineering research and education. TMP currently has 11 active research faculty with interest areas grouped into two core strengths: materials characterization and thermal hydraulics. <http://nuclear.usu.edu/>

VIRGINIA COMMONWEALTH UNIVERSITY

Mechanical and Nuclear Engineering
401 West Main Street
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Website: <https://egr.vcu.edu/departments/mechanical-nuclear-engineering/>

	7/24-6/25	7/25-6/26
B.S./NE	11	10
Masters/MNE	39	36
PhD/MNE	7	10

Number of Graduates

Graduate Student Enrollment (MNE): 98 Masters/61 Ph.D.

ABET Accreditation: B.S. in Mechanical Engineering, with a Nuclear Engineering Concentration
Combined Masters and PhD programs in Mechanical and Nuclear Engineering

Nuclear Science and Engineering Faculty

Gennady Miloshevsky, Director of Nuclear Engineering Program and Associate Professor (804-827-0990) [gennady@vcu.edu] Ph.D., Heat and Mass Transfer Institute of the National Academy of Sciences of Belarus, 1998. Computational physics; shielding of space radiation; fission SNM sources; plasma physics and atomic spectra; CFD; two-fluid liquid metal plasma flows; warm dense matter. Website: <https://egr.vcu.edu/directory/gennady.miloshevsky/>

Lane Carasik, Associate Professor [lcarasik@vcu.edu] Ph.D., Texas A&M University, 2017. Thermal hydraulics for fusion & fission energy systems, isotope production, and instrumentation development. Website: <https://egr.vcu.edu/directory/lane.carasik/>

Zeyun Wu, Associate Professor (804-827-0237) [zwu@vcu.edu] Ph.D., Texas A&M University, 2010. Reactor Physics; Reactor core design and analysis; Reactor Safety Analysis; Multiphysics modeling and simulation; Computational methods for neutron transport; Uncertainty and sensitivity analysis; Data analytics and Machine learning. Website: <https://egr.vcu.edu/directory/zeyun.wu/>

Ambreen Nisar, Assistant Professor, [nisara@vcu.edu] Ph.D., Indian Institute of Technology, Kanpur, 2017. Fusion and nuclear materials involving manufacturing and performance of structural ceramics and composites; Cold spray deposition; Unconventional spark plasma sintering; Interfacial joining.

Arvind Agarwal, Professor and Chair, Mechanical and Nuclear Engineering (804-827-4006) [agarwala15@vcu.edu] Ph.D., University of Tennessee, Knoxville, 1999. Additive Manufacturing (AM) of Metals via Wire Arc AM; Cold Spray; Thermal Spray; Friction Stir Surface Engineering; Aerospace Materials and Radiation Shielding Coatings; Graphene and Boron Nitride Nanotube Composites; Ultrahigh Temperature Ceramics. Website: <https://egr.vcu.edu/directory/arvind.agarwal/>

Gary Tepper, Professor and Senior Associate Dean for Academic and Faculty Affairs (804-827-4079) [gctepper@vcu.edu] Ph.D., University of California, San Diego, 1993. Radiation detection and measurement, sensor design, nanoscale materials. Website: <https://egr.vcu.edu/directory/gary.tepper/>

Other Faculty

Reza Mohammadi, Associate Professor (804-827-3997) [rmohammadi@vcu.edu] Ph.D., University of Alberta, Canada, 2008. Ultra-incompressible superhard materials for extreme conditions; Radiation and shielding; Superhydrophobic materials for nonwetttable applications; Thin film deposition and characterization; Metal forming and working. Website: <https://egr.vcu.edu/directory/reza.mohammadi/>

Radhika Barua, Assistant Professor (804-828-2570) [rbarua@vcu.edu] Ph.D., Northeastern University, Boston, Functional magnetic materials processing (ferrous alloys, ferrites and polymer composites), field -assisted extrusion- and laser-based metal additive manufacturing, microstructure control and phase transformation, multi-scale magnetic modelling. Website: <https://egr.vcu.edu/directory/radhika.barua/>

Ibrahim Guven, Associate Professor (804-827-3652) [iguven@vcu.edu] Ph.D., University of Arizona, 2000. Fracture and failure analysis using Peridynamics; Impact and penetration mechanics; Multi-scale modeling of physical phenomena; Micro/nano-scale testing and measurement techniques. Website: <https://egr.vcu.edu/directory/ibrahim.guven/>

Carl Elks, Associate Professor (804-828-8222) [crelks@vcu.edu] Ph.D., University of Virginia, 2005. Resilient Cyber Physical Systems; Systematic SW testing; Runtime Verification and Monitoring; Fault injection; Cyber threat and vulnerability, and modernization strategies for energy and utility infrastructures, especially for Nuclear Power Plants. Website: <https://egr.vcu.edu/directory/carl.elks/>

Milos Manic, Professor (804-827-3999) [misko@vcu.edu] Ph.D., University of Idaho, 2003. Computational Intelligence Techniques (Machine Learning) with Applications in Energy Cybersecurity and Human Machine Interfaces; Software Defined Networks; Fuzzy Neural Data Mining Techniques; Energy Security; Human machine Interfaces. Website: <https://egr.vcu.edu/directory/milos.manic/>

Nuclear Science and Engineering Research Centers

Radiation Detection and Measurement Laboratory: The Radiation Detection and Measurement Laboratory is a dual use space, utilized for both graduate and undergraduate teaching and research. This laboratory is equipped with essential instruments for the detection and measurement of alpha, beta, gamma, and neutron radiation. The space occupies approximately a 1,200 square feet area and is fitted with gas proportional counters, NaI scintillation spectrometers, silicon charged particle radiation detectors, and ^3He neutron detectors. This lab flows in tandem with the Environmental Radionuclide Assay Laboratory, a low background counting research space designed to quantify radionuclide concentrations in environmental and other low activity samples. Specific additional equipment includes a low background 40% HPGe LabSOCS system, an HPGe ISOCS system and a multi sample liquid scintillation counter.

Nuclear Reactor Simulator Laboratory: The Nuclear Reactor Simulator Laboratory is home to the GSE Solutions GPWR (Generic Pressurized Water Reactor) nuclear reactor simulator. This is a state-of-the-art, full-scope reactor simulator designed to accurately mimic the behavior, operation, and control of a large, commercial, three-loop pressurized water reactor (PWR) similar as those found at the Dominion Energy North Anna and Surry Nuclear Power Stations in Virginia. The simulator enables student understanding of the fundamentals of nuclear power plant operation while permitting students to simulate unanticipated events and nuclear accidents. This enables confidence that the behavior they observe is an accurate, real-time representation of the response of a commercial power reactor. The simulator features a programmable interface allowing it to be used not only for education but for research in such diverse fields as human factors engineering, reactor control room digitalization and design, and cyber security.

Nanomaterials Core Characterization Facility: The Nanomaterials Core Characterization Facility (NCC) is a research core facility of the VCU Office of Research and located in the Institute for Engineering and Medicine. The NCC is also a partnership between the VCU College of Engineering and the VCU College of Humanities and Sciences. As a core research facility, resources and services are available by contract to not only university faculty but industry as well. The NCC offers technologies that benefit multi-disciplinary industrial and scholarly research in a broad range of sciences to modify, manipulate or tailor the surface, size, or shape of a particular material. With the NCC you gain access to over \$11 million in sophisticated materials characterization equipment and analytical services unique to the mid-Atlantic region.

The Computational Energy-Material-Interaction Laboratory (PI: Miloshevsky): The Computational Energy-Material-Interaction Laboratory (CEMIL) focuses on the interaction of intense energy fluxes such as radiation, plasma, particle and laser beams with materials and prediction of material behavior and properties under extreme pressures and temperatures. The research areas include modeling of thermodynamic, optical, and electrical properties of Warm Dense Plasmas; computational studies of the internal charging of dielectric and insulating materials of a spacecraft under the impact of Jovian electrons and photons (Europa Lander project); modeling of ultrafast laser-material interactions at an atomic level, nature and behavior of materials in a highly non-equilibrium state; and theoretical analysis and computational modeling of macroscopic melt splashes and losses from metallic divertor plates and wall materials in fusion devices such as ITER.

The Computational Applied Reactor Physics Laboratory (PI: Wu): The Computation Applied Reactor Physics Laboratory (CARPL) centers on developing efficient and accurate computational methods on fission reactor and other nuclear applications. CARPL also utilizes state-of-the-art nuclear computer codes to tackle challenging and contingent problems in reactor physics, reactor design and analysis, and nuclear -data sensitivity and uncertainty analysis by performing multi-scale and multi-physics integrated computational modeling and simulation.

The Fluids in Advanced Systems and Technology Research Group (PI: Carasik): The Fluids in Advanced Systems and Technology (FAST) Group is a computational and experimental thermal hydraulics group focused on enabling technologies for fusion energy, nuclear energy, and isotope production. This group utilizes and develops high fidelity computational fluid dynamics (CFD) and system modeling tools for different types of working fluids/coolants. The group conducts experimental activities for investigating fundamental phenomena in thermal-fluid systems, creating validation data for high fidelity CFD tools, and proof-of-concept testing for new enabling technologies.

The Cold-X Laboratory (Cold Spray for eXtreme Environment) (PI: Agarwal): Cold-X Laboratory is being established in the Mechanical and Nuclear Engineering department at VCU which is equipped with low and medium pressure cold spray systems with gas temperature up to 700 C. The focus of the lab is to develop advanced materials and coatings for nuclear, aerospace, and defense applications with novel interfaces for extreme thermal, radiation, and space environments. A defining strength of the lab is the integration of in situ sensing, real-time diagnostics, and high-speed imaging to uncover the fundamental physics of particle impact, bonding, and deformation, especially in brittle and functional materials.

The Functional Materials and Devices Laboratory (PI: Tepper): The Functional Materials and Devices Laboratory is focused on the development and characterization of new materials and devices such as polymer nanofibers for filtration, tissue engineering and non-wetting surfaces, organic-inorganic crystalline films for photovoltaic applications, and nanoporous materials for chemical and radiological sensing.

Virginia Innovative Nuclear (VIN) Hub: A nonprofit organization formed by 4 Virginia universities including Virginia Commonwealth University, University of Virginia, Virginia Tech, and Liberty University with partnership with the Virginia Nuclear industry represented by the Virginia Nuclear Energy Consortium (VNEC) nonprofit. VCU serves as a key supporter of this organization that its mission includes nuclear workforce, public engagement, and applied and basic R&D.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

(Virginia Tech)

Nuclear Engineering Program, Mechanical Engineering Department

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Greater Washington DC Area (GWDCA) Campus,

Virginia Tech Research Center

900 N. Glebe Road

Arlington, VA 22203

Director: Alireza Haghighat (haghighat@vt.edu)

Program Coordinator: Lisa Lawson (lisarc10@vt.edu)

Website: <https://me.vt.edu/for-students/nuclear-engineering.html>

	7/24-6/25	7/25-6/26
Undergraduate Minor	39	74
Masters	9	8
Ph.D.	1	1

Graduate Student Enrollment AY 25: 12 Masters/ 14PhD

Graduate Student Enrollment AY 26: 15 Masters/ 15PhD

Distance Education Program

Offers Nuclear Engineering Courses Online

Nuclear Engineering Faculty

Alireza Haghighat, Program Director, Robert E. Hord, Jr. Endowed Professor (352-871-1099) [haghighat@vt.edu]. Ph.D., University of Washington, 1986. Research in Advanced particle transport methods (deterministic and statistical Monte Carlo) and their applications in reactor physics analysis and design, radiation shielding, nuclear security and safeguards, and medical imaging; multi-physics analysis for advanced reactor design and simulation; perturbation methods; virtual reality visualization; parallel computing; physics-informed AI/ML (Located at the GWDCA campus).

David Freeman, Collegiate Associate Professor [davidf1@vt.edu]. Ph.D., University of Missouri-Rolla, 1998. Accelerator Safety, Neutron Scattering Instrumentation, Neutron Target and Cryogenic Hydrogen Moderator Systems, and nuclear reactor operation.

Amanda Leong, Research Assistant Professor (614-843-8934) [aleongsw@vt.edu]. Ph.D., Virginia Tech, 2022. Materials Characterization (Combustion Analysis, Inert Gas Fusion, Inductively Couple Plasma -Mass Spectrometry, X-ray Diffraction, Scanning Electron Microscopy, X-ray Photoelectron Spectroscopy, Ultraviolet-visible spectroscopy, Thermal analysis); Applied Mathematics in Nuclear Engineering.

Yang Liu, Associate Professor (540-231-8068) [liu130@vt.edu]. Ph.D., Purdue University, 2008. Nuclear thermal hydraulics and reactor safety; Two-phase flow modeling, instrumentation and experiment; Two-phase flow computational fluid dynamics; Advanced passive safety system design.
Website: <https://sites.google.com/a/vt.edu/vtmftl/>

Jinsuo Zhang, Professor (540-231-1988) [zjinsuo@vt.edu]. Ph.D., Zhejiang University, 2001, Nuclear materials compatibility (materials corrosion/degradation); Nuclear fuel materials (metallic fuel, fuel-cladding chemical interactions, fuel-coolant interactions); Nuclear fuel cycle technology (pyroprocessing); Electrochemical separation; Nuclear safeguards and nonproliferation; Advanced coolant materials (molten salt, liquid metal).

Affiliate/Adjunct Faculty

Patrick Huber, Professor of Physics (540-231-8727) [pahyber@vt.edu], Ph.D., Technische Universität München, Theoretical Physics, Numerical methods to accurately and efficiently predict physics sensitivities of yet to be built experiments, theoretical analysis of neutrino physics.

Nathan Lau, Associate Professor Industrial and Systems Engineering (540 231-5936) [nkclau@vt.edu], Ph.D. University of Toronto. Dr. Lau's ongoing research projects include: (i) concept of operations and display design research in cyber-security for remotely piloted aircrafts operations center, (ii) hardware and-human-in-the-loop research program for nuclear process control, (iii) efficiency investigation of the manufacturing and repairing processes of jet engine turbines, (iv) development of a driver distraction alert system using motion capture and sonification technology, and (v) usability and evaluation study for an artificial pancreas.

Johnathan Link, Professor of Physics & Director of Center for Neutrino Physics (540-231-5321) [jonathan.link@vt.edu], Ph.D., University of California at Davis. Leading the development of the CHANDLER antineutrino detection system for application to power reactor safeguards.

Roop Mahajan, Lewis A. Hester Chair in Engineering, Professor of Mechanical Engineering (571-858-3355) [mahajanr@vt.edu], Ph.D., Cornell University, 1977, Advanced Electronic Cooling; Two-Phase Flows; Porous Media; Synthesis and application of graphene and its derivatives and composites; Biomedical Devices; Emerging and Black Swan Technologies; Cross-cutting technologies for sustainable communities; Next generation engineering curriculum.

Ranga Pitchumani, George R. Goodson Professor of Mechanical Engineering (571-858-3251) [pitchu@vt.edu], Ph.D., Carnegie-Mellon University, 1992. Research in Energy Systems; Energy/Water Nexus; Electric Grid Integration of Renewable Energy; Materials Processing and Manufacturing; Uncertainty Quantification and Large-Scale Optimization; and, Micro and Nanoscale Technologies.

Nicholas Polys, Director of Visual Computing, Research Computing Group (540 231-0968) [npolys@vt.edu], Ph.D., Virginia Tech, 2006. His research interests lie at the center of graphics and Human Computer Interaction: the intersection of visualization, virtual environments, and perception.

Patrick Roberts, Associate Professor of School of Public and International Affairs (202 599-0562) [robertsp@vt.edu], Ph.D., Government, University of Virginia, 2006. Research in Emergency management in government; Development of disaster and security organizations and their capacity; Organizational autonomy; and Current global security threats.

Sonja Schmid, Professor of Science and Technology in Society (703-538-8482) [sschmid@vt.edu], Ph.D., Cornell University, 2005. Nuclear security and safeguards; S&T policy; emergency response; energy policy in international perspective.

Luka Snoj, Head of Reactor Physics Division of Jozef Stefan Institute, Professor of Nuclear Engineering at the Ljubljana University (LU), Slovenia [luka.snoj@ijs.si], Ph. D., LU. His research interest is mainly theoretical reactor physics related to practical applications in power and research reactors, in particular: Monte Carlo transport of neutrons and photons in fission and fusion nuclear reactors, integral reactor experiments, criticality experiments and calculations.

Dr. Anne Staples, Associate Professor of Mechanical Engineering (540 231-7570) [staplesa@vt.edu], Ph.D., Princeton, 2006. Director of the Laboratory for Fluid Dynamics in Nature (FINLAB). Research in FINLAB centers on computational fluid dynamics (CFD) and biological and bio-inspired transport, leveraging machine learning, theoretical modeling, and experimental microfluidics to explore a range of fluid dynamics phenomena across natural and engineered systems.

Danesh Tafti, W. S. Cross Professor, Mechanical Engineering Department (540-231-9975) [dtafti@exchange.vt.edu], Ph.D., Pennsylvania State University, 1989. Develop and apply large-scale high performance simulation tools to a wide range of physical phenomena in the fluid -thermal sciences; applications include internal and external cooling of turbine vanes and blades, heat transfer enhancement surfaces in compact heat exchangers, fluidized beds, cardio-vascular flows, cooling of reactor reflector regions and in-core self-powered neutron detectors, aerodynamics of flapping flight for Micro -Air Vehicle (MAV) applications, CO2 capture, microfluidics, and flows in solid rocket motors.

Nuclear Science and Engineering Research Centers

Center for Nuclear Materials and Nuclear Fuel Cycle (NMFC): Director, Jinsuo Zhang (540-231-1988) [zjinsuo@vt.edu]. Research activities including liquid metal and molten salt coolant chemistry and control, material corrosion by liquid metal, high temperature water and molten salt and corrosion control, electrochemical separation for spent fuel treatment, metallic nuclear fuel and fuel/cladding chemical interactions. The center current has a molten chloride salt loop, two high-temperature loops, electrochemical cells for high/room temperature corrosion studies, six electrochemical potentiostat for molten salt chemistry studies, three glovebox systems for providing inert conditions for experiments with chemistry control.

MARS - Center for Multiphysics for Advanced Reactor Simulation: Director, Alireza Haghighat (571 858-3043) [haghighat@vt.edu] The vision of MARS is to establish itself as the Center for the development of detailed physics-based AI-assisted Multiphysics algorithms and simulation tools capable of design and safety analysis of advanced and innovative reactors in real-time. This will be accomplished by combining a team of professors (both domestic and international) with different backgrounds (such as reactor physics, reactor thermal - hydraulics, material science, and chemistry), and private organizations. (<https://gemi.ictas.vt.edu/research/s3npower.html>)

Multiphase Flow and Thermal-hydraulics Laboratory (MFTL): Director, Yang Liu [liu130@vt.edu] (540- 231-8068) Research activities include two-phase flow visualization and measurement, advanced conductivity probe, fast X-ray flow imaging system, particle image velocimetry, measurement uncertainty quantification, bubble, drop and film dynamics, multi-group two-fluid model, interfacial area transport equation, computational fluid dynamics, interface resolved simulation, two-phase flow induced vibration, passive safety system design, reactor safety analysis. (<https://sites.google.com/a/vt.edu/vtmftl/>)

Virginia Tech Transport Theory Group (VT3G): Group Leader, Alireza Haghighat [haghighat@vt.edu] (352-871-1099) VT3G is engaged in development of hybrid 3-D, multi scale, parallel particle transport algorithms and codes, and their application to nuclear energy, nuclear security and non-proliferation and radiation therapy and diagnosis; development virtual reality systems for particle transport simulation. (<http://nsl.ncr.vt.edu/vt3g.html>)

Virginia Innovative Nuclear (VIN) Hub: A nonprofit profit organization formed by four Virginia universities including Virginia Tech, Virginia Commonwealth University, University of Virginia, and Liberty University with partnership with the Virginia Nuclear industry represented by the Virginia Nuclear Energy Consortium (VNEC) nonprofit. Prof. Haghighat is the Chief Scientific Officer of this organization that its mission includes nuclear workforce, public engagement, and applied and basic R&D.

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Department of Nuclear Engineering & Engineering Physics

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	7/24-6/25	7/25-6/26
B.S.	18	25
Masters	15	6
Ph.D.	12	5

Number of Graduates

Graduate Student Enrollment: 19 Masters / 69 Ph.D.

ABET Accreditation: Nuclear Engineering

Nuclear Science and Engineering Faculty

Kathryn Huff, Department Chair and Professor [katy.huff@wisc.edu] Ph.D. University of Wisconsin–Madison 2013. Molten Salt Reactors, High-Temperature Gas Reactors, Micro-Reactors, Fluoride-Salt-Cooled High-Temperature Reactors; Scientific computing education; Repository system performance modeling; Open & reproducible scientific computing; Computational methods for optimization and prediction.

JungHyun Bae, Assistant Professor [junghyun.bae@wisc.edu] Ph.D., Purdue University, 2022. Radiation detection and measurement; Nuclear security, safeguards, and nonproliferation; Spent nuclear fuel storage and waste management; Radiography.

Website: <https://engineering.wisc.edu/directory/profile/junghyun-bae/>

Jamie B. Coble, Professor [jcoble@wisc.edu] Ph.D. University of Tennessee-Knoxville, 2010. Data analytics, AI/ML, and digital thread for robust decision making: empirical modeling, process and equipment monitoring, anomaly detection and diagnostics, system prognostics, enhanced risk monitoring, supervisory control, operations and maintenance optimization, flexible concepts of operation, and operator and engineering support systems.

Adrien Couet, Professor (608-265-7955) [couet@wisc.edu] Ph.D., Penn State University, 2014. Nuclear materials; Irradiation damage; Corrosion of metals and alloys; Oxidation model; Electrochemistry; Synchrotron radiation; Defect transport in oxides.

Website: <https://engineering.wisc.edu/directory/profile/adrien-couet/>

Stephanie Diem, Assistant Professor (608-263-1414) [sjdiem@wisc.edu] Ph.D., Princeton University. Experimental plasma physics; Magnetically confined plasmas; Microwave heating and current drive; Electron Bernstein wave emission, heating and current drive; Understanding and controlling edge instabilities in plasmas. Website: <https://engineering.wisc.edu/directory/profile/stephanie-diem/>

Juliana Pacheco Duarte, Associate Professor (608-265-7955) [pachecoduarte@wisc.edu] Ph.D., University of Wisconsin-Madison, 2018. Safety analysis; Thermal-hydraulics; Post-critical heat flux; Two-phase flow. Website: <https://engineering.wisc.edu/directory/profile/juliana-pacheco-duarte/>

Benedikt Geiger, Associate Professor (608-262-3386) [benedict.geiger@wisc.edu] Ph.D., Ludwig-Maximilians University, 2013. The experimental investigation of turbulent particle and heat transport in present day devices with the aim to develop new turbulence-optimized stellarator experiments. Website: <https://engineering.wisc.edu/directory/profile/benedikt-geiger/>

Chris C. Hegna, Professor (608-263-0810) [cchegna@wisc.edu] Ph.D., Columbia, 1989. Theoretical plasma physics; fusion science; magnetic confinement of plasmas; magnetohydrodynamics. Website: <https://engineering.wisc.edu/directory/profile/chris-heгна/>

Charles Hirst, Assistant Professor (608-263-2760) [cahirst@wisc.edu] Ph.D., Massachusetts Institute of Technology, 2022. Nuclear materials; Radiation damage; In situ experiments; Coupled extremes; Irradiation creep mechanisms; Gradient experiments; Thermal analysis; Defect recovery stages; Differential scanning calorimetry; Stored energy. Website: <https://engineering.wisc.edu/directory/profile/charlie-hirst/>

Benjamin Lindley, Assistant Professor (608-263-1946) [lindley2@wisc.edu] Ph.D., University of Cambridge, 2014. Design and analysis of advanced nuclear reactors, with emphasis on core design; Reactor physics and multiphysics methods development; Flexible operation of nuclear reactors: Integrated Energy Systems, cogeneration, load-following, advanced power conversion cycles; Market and economic context for advanced nuclear power; Fuel cycle analysis; Uncertainty quantification, reduced order modelling and data assimilation. Professional Engineer. Website: <https://engineering.wisc.edu/directory/profile/ben-lindley/>

Sébastien Philippe, Assistant Professor (608-865-9257) [sphilippe@wisc.edu] Ph.D., Princeton University, 2018. Nuclear weapon effect modeling; Nuclear security and nonproliferation; Arms control verification; Remote sensing; Nuclear policy. Website: <https://engineering.wisc.edu/directory/profile/sebastien-philippe/>

Oliver Schmitz, Professor (608-265-3633) [oschmitz@wisc.edu] Ph.D., Physics, Heinrich-Heine-Universität, Düsseldorf, 2006. Plasma Edge Physics, Plasma Wall Interaction, Three-Dimensional Plasma Edge Transport and Wall Interaction, Helicon Plasma Generation and Sustainment, Active Plasma and Neutral Spectroscopy, Plasma Sources and Diagnostics, Atomic Modeling for Plasma Diagnostics, Laser-Based Plasma Spectroscopy, Next Generation Plasma Wakefield Accelerators. Website: <https://engineering.wisc.edu/directory/profile/oliver-schmitz/>

Kumar Sridharan, Professor (608-263-4789) [kumar.sridharan@wisc.edu] Ph.D., University of Wisconsin-Madison, 1989. Nuclear reactor materials research and development; Irradiation effects in materials; Corrosion of materials; High temperature materials; Physical metallurgy and mechanical behavior of materials; Ion implantation and plasma-assisted thin film deposition of materials; Surface modifications and coatings including nanoscale processes and materials; Emerging and commercial surface engineering technologies; Wear and nanotribology of materials; Processing-structure-properties-performance relationships in materials; Conventional and advanced materials characterization and analysis techniques; Materials applications, challenges, and solutions for a broad spectrum of industrial applications; Failure analysis.
Website: <https://engineering.wisc.edu/directory/profile/kumar-sridharan/>

Paul P. H. Wilson, Professor (608-263-0807) [paul.wilson@wisc.edu] Ph.D., University of Wisconsin–Madison, 1999. Nuclear fuel cycles; transmutation/depletion/activation; proliferation analysis; energy policy; Monte Carlo methods; reactor core design & analysis.
Website: <https://engineering.wisc.edu/directory/profile/paul-wilson/>

Adelle Wright, Assistant Professor (608-375-5712) [adelle.wright@wisc.edu] Ph.D., Australian National University, 2021. Fusion energy and stellarators; High performance scientific computing Magnetohydrodynamics; Nonlinear and dynamical systems; Science diplomacy and policy.
Website: <https://engineering.wisc.edu/directory/profile/adelle-wright/>

Yongfeng Zhang, Associate Professor (608-890-3779) [yzhang2446@wisc.edu] Ph.D., Rensselaer Polytechnical Institute, 2009. Multiscale modeling and simulation of materials aging and degradation in extreme conditions: Irradiation effect, Mechanical degradation, Corrosion and stress corrosion cracking.
<https://engineering.wisc.edu/directory/profile/yongfeng-zhang/>

Other Faculty

Mark Anderson, Consolidated Papers Professor (608-263-2802) [manderson@engr.wisc.edu] Ph.D., University of Wisconsin–Madison, 1998. Fundamental physics and applications relating to advanced energy utilization; energy extraction and energy production with focus on experimental thermal hydraulics for advanced nuclear; solar and waste heat recovery energy sources. Also, Mechanical Engineering, Wisconsin Energy Institute.
Website: <https://engineering.wisc.edu/directory/profile/mark-anderson/>

Laura Bartol, Associate Faculty Associate [ljplesha@wisc.edu] Ph.D., University of Wisconsin–Madison, 2012.
Website: https://directory.engr.wisc.edu/neep/Faculty/Bartol_Laura/

Bryan Bednarz, Assistant Professor (608-262-5225) [bbednarz2@wisc.edu] Ph.D., Rensselaer Polytechnic Institute, 2008. Monte Carlo method; Proton therapy; Radiation protection.
Website: https://directory.engr.wisc.edu/neep/Faculty/Bednarz_Bryan/

Vicki Bier, Professor Emeritus [bier@engr.wisc.edu] Ph.D. Massachusetts Institute of Technology, 1983. Security in the supply chains for food and agricultural products; Critical infrastructure protection; Security; Technology hazards; Risk analysis; Decision analysis; Operations research.
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Riccardo Bonazza, Professor (608-265-2337) [bonazza@engr.wisc.edu] Ph.D., California Institute of Technology, 1992. Experimental fluid mechanics and heat transfer; impulsive unsteady phenomena; shock tube applications; laser and X-ray imaging & measuring techniques.
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Curt A. Bronkhorst, Professor (608-890-2586) [cbronkhorst@wais.edu] Ph.D., Massachusetts Institute of Technology. Theoretical/computational mechanics of materials; computational plasticity; multi-scale material modeling; damage mechanics; single crystal plasticity; dynamic material behavior; structural phase transformation. Website: <https://engineering.wisc.edu/directory/profile/curt-bronkhorst/>

Jennifer Choy, Assistant Professor (608-263-6974) [Jennifer.choy@wisc.edu] Ph.D., Harvard University, 2013. Quantum engineering; atomic and optical physics; nanophotonics; development and characterization of solid-state defects; quantum sensing using atoms and defects in solids; inertial navigation and timekeeping.
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Jan Coenen, Adjunct Professor. [jcoenen2@wisc.edu] Ph.D. Heinrich-Heine-University, Duesseldorf, 2009. Radiation Resistant Materials; High HeatFlux Materials; Tungsten Fibre reinforced Tungsten; Self-passivating alloys; Liquid Metal Walls for fusion; Wendelstein 7-XJET, ASDEX Upgrade, TEXTOR and WEST: High-Z materials, melting of tungsten, plasma wall interaction, spectroscopy and edge physics. Website: https://directory.engr.wisc.edu/need/Faculty/Coenen_Jan/

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Website: https://directory.engr.wisc.edu/need/Faculty/Corradini_Michael/

Wendy C. Crone, Professor Emeritus (608-262-8384) [crone@engr.wisc.edu] Ph.D., University of Minnesota, 1998. Experimental mechanics of materials; characterization of materials such as shape memory alloys, hydrogels, and biomaterials; therapeutic medical devices.
Website: https://directory.engr.wisc.edu/need/Faculty/Crone_Wendy/

Ray J. Fonck, Professor Emeritus (608-263-7799) [fonck@engr.wisc.edu] Ph.D., Princeton, 1978. Plasma & fusion science and technology; plasma turbulence; burning plasmas; tokamaks; alternative fusion schemes; atomic physics and applied optics; high temperature plasma diagnostics.

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Jennifer Franck, Associate Professor (608-263-2562) [jafranck@wisc.edu] Ph.D., California Institute of Technology, 2009. Computational fluid dynamics; unsteady fluid mechanics; turbulent flows; wind and tidal energy; aerodynamics; flow control; propulsion; fluid-structure interaction. Website: <https://engineering.wisc.edu/directory/profile/jennifer-franck/>

Christian Franck, Professor [cfranck@wisc.edu] Ph.D., California Institute of Technology, 2008. Mechanobiology of cellular Traumatic Brain Injury; Mechanobiology of the host defense of human neutrophils; Experimental Characterization of Soft Materials; High-strain rate behavior of soft materials and tissues. Website: <https://engineering.wisc.edu/directory/profile/christian-franck/>

Scott Grutzik, Adjunct Professor. [grutzik@wisc.edu] Ph.D. Cornell University, 2015. Solid mechanics; fracture mechanics; statistical strength methods; glassy materials; and viscoelasticity. Website: https://directory.engr.wisc.edu/need/Faculty/Grutzik_Scott/

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Gerald L. Kulcinski, Professor Emeritus (608-263-1601) [kulcinski@engr.wisc.edu] Ph.D., University of Wisconsin–Madison, 1965. Magnetic/inertial fusion reactor systems studies; radiation damage and nuclear materials; lunar mining of helium-3. Website: https://directory.engr.wisc.edu/need/Faculty/Kulcinski_Gerald/

Daniel Ludois, Professor [ludois@wisc.edu] Ph.D., University of Wisconsin–Madison, 2012. Power electronics; Electric machines; Non-contact power transfer; Sustainable engineering technologies and practices. Website: <https://engineering.wisc.edu/directory/profile/daniel-ludois/>

Zhenqiang Ma, Professor [mazq.engr.wisc.edu] Ph.D., University of Michigan, 2001. Lattice mis-matched semiconductor heterostructures: materials, physics and related various device applications; Flexible/stretchable/wearable electronics/optoelectronics; Bioelectronics (ECG/ECoG), neural and neuron interface engineering; High-speed RF devices, optoelectronic devices and nanophotonics; Semiconductor materials processing and heterogeneous integration; Flexible electronics, flexible optoelectronics and flexible photonics; Energy conversion semiconductor devices; Bioelectronics and biomimetics; Semiconductor device physics; Power electronics. Website: <https://engineering.wisc.edu/directory/profile/zhenqiang-ma/>

Allison Mahvi, Assistant Professor [allison.mahvi@wisc.edu] Ph.D., Georgia Institute of Technology, 2018. Thermal energy storage materials and systems; high-efficiency thermal systems; HVAC systems; two-phase fluid dynamics; heat transfer.

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Franklin Miller, Associate Professor [fkmiller@wisc.edu] Ph.D., Massachusetts Institute of Technology, 2005. Cryogenics; Thermodynamics of Superfluid 3He-4He mixtures; Sub-Kelvin cooling for space science; Energy Systems. Website: <https://engineering.wisc.edu/directory/profile/franklin-miller/>

Dane D Morgan, Professor (608-265-5879) [ddmorgan@wisc.edu] Ph.D., University of California-Berkeley, 1998. Computational materials science for materials design; Ab initio electronic structure and multiscale; methods for large time/length scales and thermokinetics; Ab initio-based modeling of electrochemical systems and processes; Machine learning techniques for accelerating materials analysis and discovery; Application areas: nuclear materials, battery and fuel cell electrodes, electronic materials.

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Gregory A. Moses, Professor Emeritus (608-265-6567) [moses@engr.wisc.edu] Ph.D., University of Michigan, 1976. Fusion reactor design; technology enhanced learning; radiation hydrodynamics; computational engineering; nuclear reactor physics.

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Jacob Notbohm, Associate Professor (608-890-0030) [jknotbohm@wisc.edu] Ph.D., California Institute of Technology, 2013. Solid mechanics; Biomechanics; Cell mechanics; Biomaterials; Collective cell migration; Optical microscopy; Adhesion.

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Pavana Prabhakar, Associate Professor (608-265-7834) [pavana.prabhakar@wisc.edu] Ph.D., University of Michigan, 2013. Damage and failure mechanics of structural composite materials; life prediction of materials in extreme multi-physics environments; Advanced manufacturing of materials - additive manufacturing of hybrid materials; Multiscale material modeling of hierarchical materials; Process modeling - additive manufacturing and composite fabrication.

Website: <https://engineering.wisc.edu/directory/profile/pavana-prabhakar/>

Ian Robertson, Professor (608-262-3482) [irobertson@wisc.edu] Ph.D., University of Oxford, 1982. Hydrogen embrittlement; radiation damage; electron microscopy; mechanical properties.

Website: <https://engineering.wisc.edu/directory/profile/ian-robertson/>

David Rothamer, Professor (608-890-2271) [rothamer@wisc.edu] Ph.D.; Stanford University, 2008. Laser based diagnostics; Internal combustion engines; Soot formation; Influence of fuel properties on combustion. Website: <https://engineering.wisc.edu/directory/profile/david-rothamer/>

Carl R. Sovinec, Professor Emeritus (608-263-5525) [csovinec@wisc.edu] Ph.D., University of Wisconsin, Madison, 1996. Computational plasma physics; computational fluid dynamics; magnetohydrodynamics; numerical methods for partial differential equations. Website: https://directory.engr.wisc.edu/need/Faculty/Sovinec_Carl/

Krishnan Suresh, Professor (608-262-3594) [suresh@engr.wisc.edu] Ph.D., Cornell University, 1998. Topology Optimization; Design for Additive Manufacturing; Computational Mechanics High-Performance Computing; Advanced Finite Element Analysis; Finite Element Mesh Generation. Website: <https://engineering.wisc.edu/directory/profile/krishnan-suresh/>

Izabela Szlufarska, Professor (608-262-1821) [szlufarska@wisc.edu] Ph.D., University of Tennessee, 2004. Computational materials science; mechanical behavior at the nanoscale; Defect behavior in semiconductors and insulators under irradiation; Solid/liquid interfaces; Nucleation and kinetics of medium range order in bulk metallic glasses. Website: <https://engineering.wisc.edu/directory/profile/izabela-szlufarska/>

Ramathasan Thevamaran, Associate Professor (608-262-5724) [thevamaran@wisc.edu] Ph.D., California Institute of Technology, 2015. Mechanical behavior of structural materials; Dynamic properties; Hierarchical materials; Nanomaterials; Metamaterials; Wave propagation; Experimental techniques. Website: <https://engineering.wisc.edu/directory/profile/ramathasan-thevamaran/>

Dan Thoma, Professor (608-262-3751) [dthoma@wisc.edu] Ph.D., University of Wisconsin - Madison, 1992. Autonomous materials research; Metal additive manufacturing; Alloy design and development; Advanced materials for energy applications; Phase transformations for functional materials, Thermal analysis and dilatometry. Website: <https://engineering.wisc.edu/directory/profile/dan-thoma/>

RESEARCH TRAINING AND FISSION REACTORS IN NORTH AMERICA

COLORADO SCHOOL OF MINES with USGS

TRIGA 1000 kW in Partnership with the U.S. Geological Survey Tim DeBey, USGS (303) 236-4726,
tdebey@usgs.gov
Denver Federal Center, Denver, CO 80225-0046

ECOLE POLYTECHNIQUE DE MONTREAL

SLOWPOKE 20 kW - Cornelia Chilian, Director of SLOWPOKE laboratory
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IDAHO STATE UNIVERSITY

AGN-201P-103, 0.005 kW – Mary Lou Dunzik-Gougar Engineering Laboratory, Pocatello, ID 83209-8060
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KANSAS STATE UNIVERSITY

TRIGA-MkII, 1250 kW – Dr. Alan Cebula, Reactor Facility Manager
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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

MITR, 6MW - Directors, Dr. Gordon Kohse, Prof. Jacopo Buongiorno, Dr. Lance Snead Nuclear Reactor
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UMRR 200 kW – Dr. Ayodeji Alajo, Interim Director
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NORTH CAROLINA STATE UNIVERSITY

PULSTAR 1000 kW – Jason Hou, Director
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OHIO STATE UNIVERSITY

OSURR, 500 kW – Dr. Lei Raymond Cao, Director
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REED COLLEGE

Triga-MkI, 250 kW – Jerry Newhouse, Director Reed Reactor Facility, Portland, OR 97202-8199
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RENSSELAER POLYTECHNIC INSTITUTE

Walthousen Reactor Critical Facility, 0.1 kW – Professor Peter Caracappa, Director 110 Eighth Street, Troy, NY
12180-3590
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RHODE ISLAND NUCLEAR SCIENCE CENTER

RINSC, 2000 kW – Dr. Cameron Goodwin, Director 16 Reactor Road Narragansett RI 02882
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ROYAL MILITARY COLLEGE OF CANADA

SLOWPOKE-2 Facility Kathy S. Nielsen, Director
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TEXAS A&M UNIVERSITY

AGN-201, 0.005 kW
One-megawatt TRIGA (Testing, Research, Isotopes, General Atomics) reactor
Mr. Jere Jenkins, Reactor Supervisor
Nuclear Engineering & Science Center, 1095 Nuclear Science Road, College Station, TX 77843 jere@tamu.edu

UNIVERSITY OF CALIFORNIA, DAVIS

(UCD/MNRC) TRIGA 2000 kW - Dr. Wesley Frey, Director McClellan Nuclear Radiation Center
5335 Price Avenue, Bldg. 258, McClellan, Ca 95652

UNIVERSITY OF CALIFORNIA, IRVINE

TRIGA-MkI, 250 kW - Dr. George E. Miller, Reactor Supervisor and Facility Director Department of Chemistry,
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UNIVERSITY OF FLORIDA

UFTR 100 kW
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UNIVERSITY OF MASSACHUSETTS, LOWELL

1 MW Pool type reactor – Dr. Suresh Aghara, Director Radiation Laboratory, 1 University Avenue, Lowell, MA
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UNIVERSITY OF MISSOURI, COLUMBIA

MURR, 10,000 kW – Matt Sanford, Executive Director Research Reactor Center, Columbia, MO 65211
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