

# ***NUCLEAR ENGINEERING GRADUATE STUDENT ORIENTATION***

**Fall 2023**

**August 15, 2023**

# *Nuclear Engineering*

## Overview

- Welcome to Nuclear Engineering
- Introductions
- Faculty and Staff
- Support Services on Campus
- Policies, Procedures and Deadlines
- Graduate Manual
- Choosing an advisor (and committee)
- Making a plan of study
- Registration
- Student Organizations for Nuclear Engineering

# *Nuclear Engineering*

Welcome to Nuclear Engineering at Purdue University

<https://engineering.purdue.edu/NE>

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West Lafayette, IN 47907  
Phone: (765) 494-5739  
[ne@purdue.edu](mailto:ne@purdue.edu)

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# *Nuclear Engineering*

## Graduate Program



Dr. Seungjin Kim  
Capt. James F. McCarthy, Jr.  
and Cheryl E. McCarthy Head  
and Professor



Dr. Lefteri Tsoukalas  
Interim Graduate  
Program Chair  
Professor



# *Nuclear Engineering Staff*



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# *Nuclear Engineering Staff*



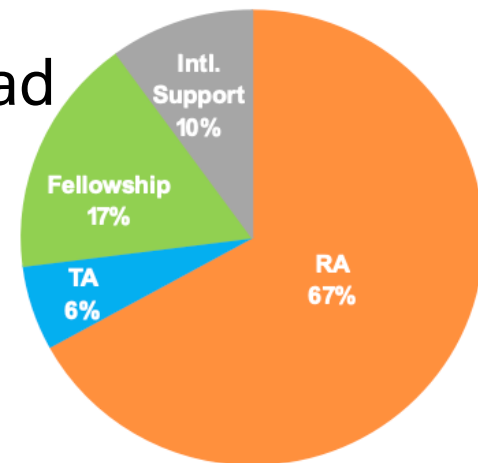
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NE Business Manager  
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# *NUCLEAR ENGINEERING OVERVIEW*

- To provide an opportunity to learn about our faculty research
- A total of 15 Faculty
  - ✓ 9 Full Professors (2 Distinguished Professors)
  - ✓ 3 Associate Professors
  - ✓ 3 Assistant Professors
- 1 Research Faculty, 11 Adjunct/Courtesy Faculty and 4 Emeritus Faculty.
- A total of 168 students as of Fall 2022 (62 Grad Students) 100% of graduate students have financial support



# *NUCLEAR ENGINEERING RESEARCH AREAS*

- ✓ Instrumentation & control
- ✓ Nuclear Materials
- ✓ Radiation detection & measurement
- ✓ Reactor Physics
- ✓ Thermal-hydraulics
- ✓ Thermonuclear Fusion
- ✓ Verification / Uncertainty Quantification
- ✓ Cyber Security
- ✓ Food / Agricultural / Industry Applications.
- ✓ Fuel Cell / Hydrogen Prod.
- ✓ Nuclear Biomedical / Nuclear Medicine
- ✓ Nuclear non-proliferation.
- ✓ Nuclear Security
- ✓ Plasma Material Interactions

# ***FACULTY AND RESEARCH***

# *Nuclear Engineering Faculty*



**Dr. Hany Abdel-Khalik**  
**Professor**

**Research Interests**

- Computational Reactor Physics
- Reduced Order Modeling and Complexity Reduction
- Uncertainty Quantification and Sensitivity Analysis
- Data Assimilation and Model Calibration



**Dr. Hitesh Bindra**  
**Associate Professor**

**Research Interests**

- Nuclear Reactor Safety
- Thermal-Fluid Science
- Statistical learning and Multiscale Safety for Advanced Reactors
- Thermal Energy Storage
- Micro-Reactor Applications

# *Nuclear Engineering Faculty*



**Dr. Stylianos Chatzidakis**

**Assistant Professor, Associate Reactor Director and Director of Nuclear Engineering Radiation Laboratory**

**Research Interests**

- Computational radiation imaging and cosmic ray muon tomography
- Embedded sensors and nuclear sensing
- Quantum key distribution
- Instrumentation and control
- Spent nuclear fuel storage, transportation, and disposal
- Scientific machine learning, convolutional neural networks,



**Dr. Chan Choi**  
**Professor**

**Research Interests**

- Thermonuclear Fusion Plasma Engineering
- Compact Tori Plasma / Reactor Studies
- Inertial Confinement Fusion Beam Target Stability
- Fusion Space Propulsion
- Direct Energy Conversion
- Nuclear Nonproliferation Enabling Capabilities

# *Nuclear Engineering Faculty*



**Dr. Allen Garner**  
**Professor**  
**Undergraduate Program Chair**

**Research Interests**

- Biomedical Applications of Pulsed Power and Plasmas
- Plasma Physics
- Pulsed Power
- High Power Microwaves
- Theoretical Biophysics



**Dr. Ahmed Hassanein**  
**Paul L. Wattelet Distinguished Professor**

**Research Interests**

- 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



# *Nuclear Engineering Faculty*



**Dr. Mamoru Ishii**  
**Walter Zinn Distinguished Professor**

**Research Interests**

- Two-phased Flow Experiments and Modeling Research
- 3-D Two-fluid Model and Interfacial Area Transport Equation Development
- Advanced Light Water Reactor Safety Code Development
- LWR and LMFBR Safety Analysis
- Severe Accident Analysis



**Dr. Seungjin Kim**  
**Capt. James F. McCarthy, Jr. and Cheryl E. McCarthy Head Professor**

**Research Interests**

- Experimental Two-Phase Flow
- Thermal Hydraulics and Reactor Safety
- Multiphase Instrumentation

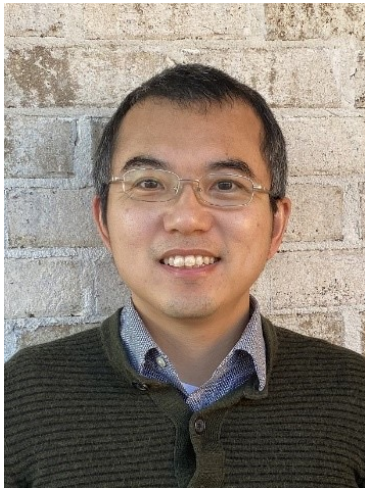
# *Nuclear Engineering Faculty*



**Dr. Martin Lopez-De-Bertodano**  
**Associate Professor**

**Research Interests**

- Experimental Two-Phase Flow
- Computational Fluid Dynamics
- Turbulence
- Thermal Hydraulics and Reactor Safety
- Nuclear Systems Simulation



**Dr. Xiaoyuan Lou**  
**Associate Professor**

**Research Interests**

- Advanced manufacturing for nuclear
- Structural alloys and composites
- Material degradation in extreme environments
- Irradiation effects of materials
- Mechanical behavior of materials
- Data analytics and machine learning

# *Nuclear Engineering Faculty*



**Dr. Shripad Revankar**  
**Professor, Graduate Program Chair**

**Research Interests**

- Two-Phase Flow and Heat Transfer
- Advance Reactor Design and Testing
- Reactor Safety and Thermal Hydraulics
- Severe Accident Analysis
- Nuclear Hydrogen Generation
- Fuel Cell, Hydrogen Systems, Renewable Energy



**Dr. Rusi Taleyarkhan**  
***Professor***

**Research Interests**

- Nano-to-Macro Scale Applications of Nuclear Science
- Nuclear Reactor Thermal-Hydraulics
- Acoustic Inertial Confinement Fusion Materials and Radiation Dosimetry
- Metastable Fluid
- Radiation Interactions with Matter and Surface Modifications
- Materials Synthesis and Transmutation
- Controlled Hydrogen Production

# *Nuclear Engineering Faculty*



**Dr. Lefteri Tsoukalas**  
**Professor, Interim Graduate Program Chair**

**Research Interests**

- Neurofuzzy Methodologies for Complex Power Systems Modeling, Diagnostics and Control.
- Intelligent Instrumentation Systems and Sensors
- Man-Machine Interface
- Autonomous Systems and Robotics



**Dr. Yi Xie**  
**Assistant Professor**

**Research Interests**

- Corrosion in extreme environment
- Advanced nuclear fuel
- Sensor and sensor material
- Advanced sintering technology
- Geological repositories of radioactive waste

# *Nuclear Engineering Faculty*



**Dr. Yunlin Xu**  
**Assistant Professor**

**Research Interests**

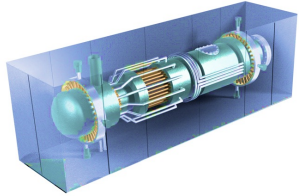
- Reactor Physics
- Nuclear Reactor Design
- Advanced Nuclear Fuel Cells
- Homeland Security

# *Hany Abdel-Khalik - Professor*

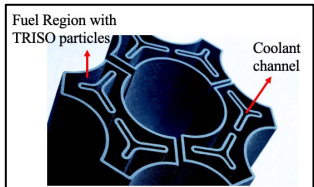
- Artificial Intelligence and Pattern Recognition Techniques for Supporting Safe, Economic, and Secure Operation of Digitally-controlled Systems/Processes
- Topics of Interest: Condition Monitoring, Cybersecurity, Model Validation & Inference, VV&UQ, Reduced Order Modeling, Breaking AI, Outsourcing AI Data, Additive Manufacturing
  - **DOE-NEUP**: AI for Additive Manufacturing Applications
  - **LANL**: Active Fingerprinting for Safeguards Technology
  - **IAEA**: AI Opportunities & Challenges of AI Nuclear Applications
  - **ORNL**: Confidence Measures for Criticality Safety Applications
  - **INL**: Model Validation for First-of-A-Kind Systems
  - **INL**: Condition Monitoring for Nuclear Power Plants
  - **INL**: Development of Cyber Toolkit for Industrial Control Systems
  - **NSF**: Cybersecurity Covert Cognizance Technology – ICORP Cohort

***Hitesh Bindra – Associate Professor***

# Nuclear Energy Systems Transport (Nu-EST) Laboratory

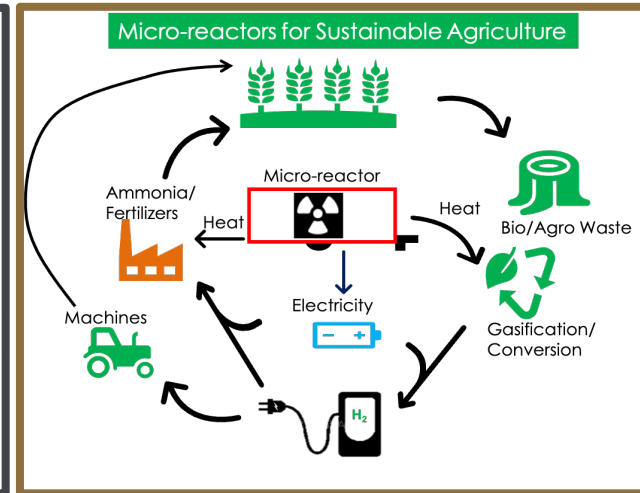
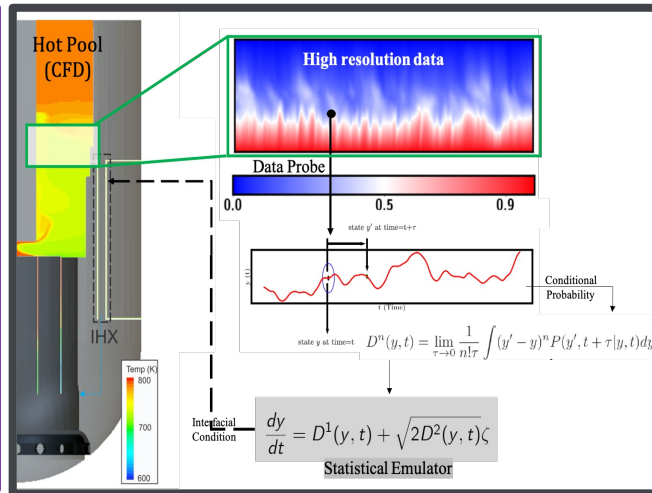


Conduction  
Cooldown in  
shippable  
Micro-HTGRs



## Loss of Forced Convection in Additively Manufactured Fuel – TCR

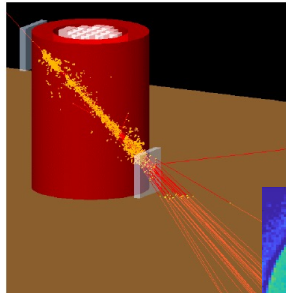
## Gas-cooled reactor Thermal-fluidic challenges



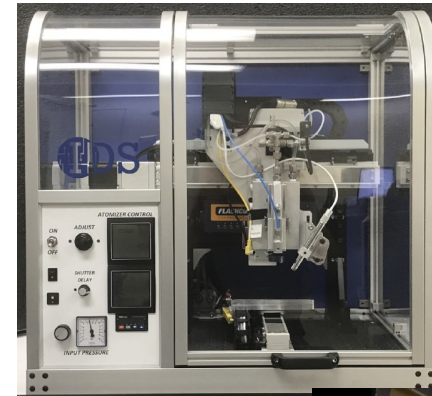
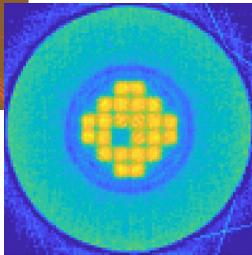


# Stylianos Chatzidakis - Assistant Professor

## Radiation Imaging and Nuclear Sensing (RADlaNS)



Muon tomography and muon spectrometry



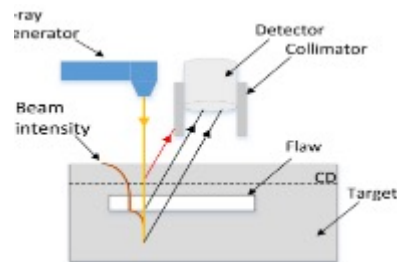
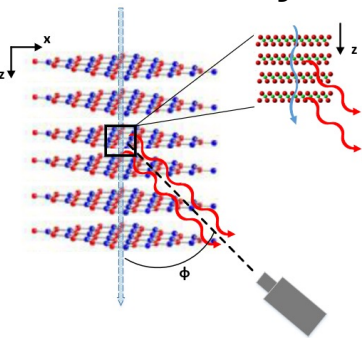
Aerosol Jet Printer @ RADlaNS  
100 nm layer thickness

New Radiation Imaging Modalities

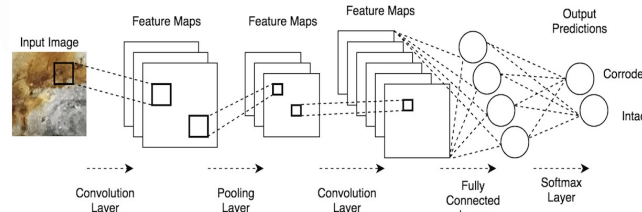
New Sensors & Sensing Modalities

AI for NE

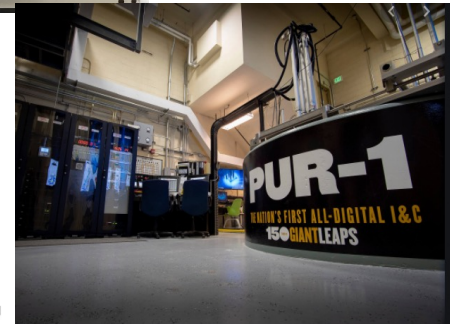
Tunable X-rays



One sided X-ray backscatter imaging



Deep Conv Neural Nets & Physics-Guided ML



Autonomous control & remote operation of microreactors



## *Chan Choi - Professor*

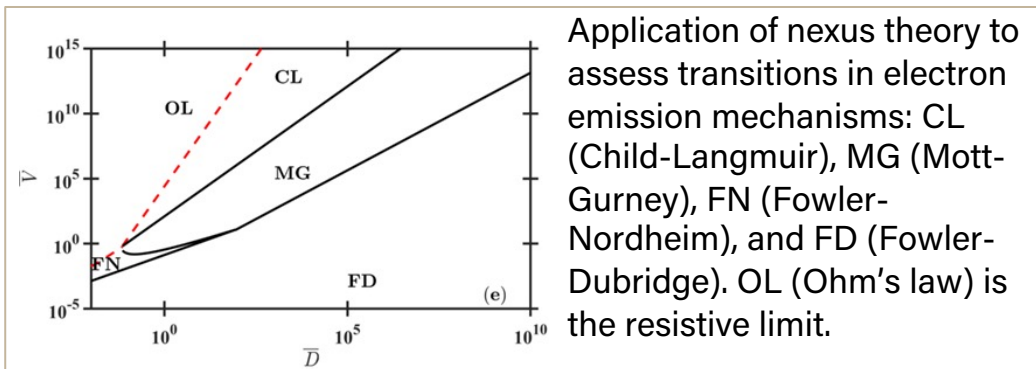
- Slowing-down of fast charged-particle fusion-products for ITER tokamak burning plasma applications
- High-density, high-temperature ICF target hydrodynamic response stability analyses
- Compact tori reactor studies for power production and mission-to-Mars fusion space propulsion applications
- Muon tomography for spent-fuel dry casks imaging and reduction of spent-nuclear-fuels w/ hybrid tandem mirror
- Nuclear Security through CNEC

# Allen L. Garner - Professor

## BioElectrics and ElectroPhysics (BEEP) Lab

### High Power Electrophysics

- Breakdown deviates from well established theories at microscale due to field emission
  - ✓ Derive universal breakdown models to predict DC and AC gas breakdown.
  - ✓ Experiments to quantify the impact of nanostructures on breakdown.
- Derivation of theories unifying multiple electron emission mechanisms.
- Theoretical assessment of crossed-field devices for defense and radiation.
- Development of novel compact, composite-based nonlinear transmission lines to generate pulsed RF radiation.

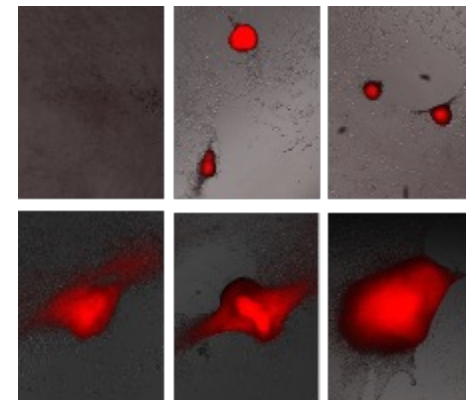


### Bioelectrics

- Apply electromagnetic radiation to modify cell membranes for cancer treatment, treat wounds, eradicate microorganisms, and reduce pain.
  - Model electromagnetic interactions with cells and tissues.
- Collaborating with
- ✓ GE on wound healing
  - ✓ Nanovis on sterilization and wound healing.
  - ✓ Luna Innovation on pin remediation.
  - ✓ U.S. Army on pulsed RF bioeffects.

7 d

14 d



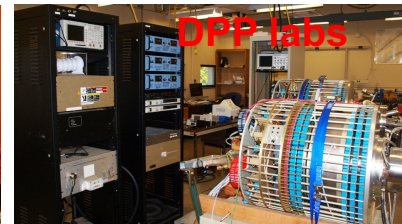
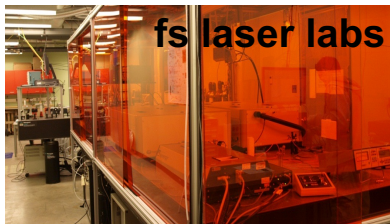
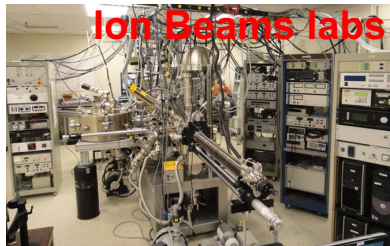
Electric pulses rapidly stimulate bone formation in osteoblasts (red)

# Ahmed Hassanein - Paul L. Wattelet Distinguished Professor

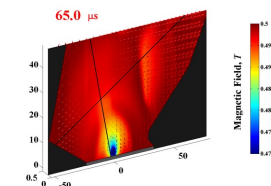
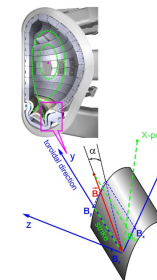
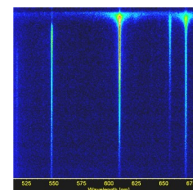
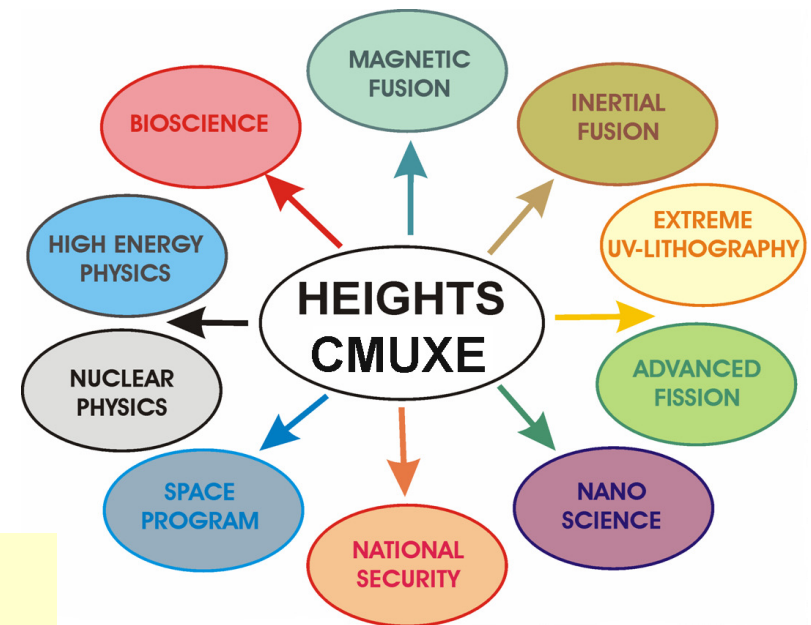
## Combining State-of- the Art Modeling & Experiments at Purdue

High Energy Interaction with General Heterogeneous Target Systems (**HEIGHTS**)

Center for Materials Under Extreme Environment (**CMUXE**)

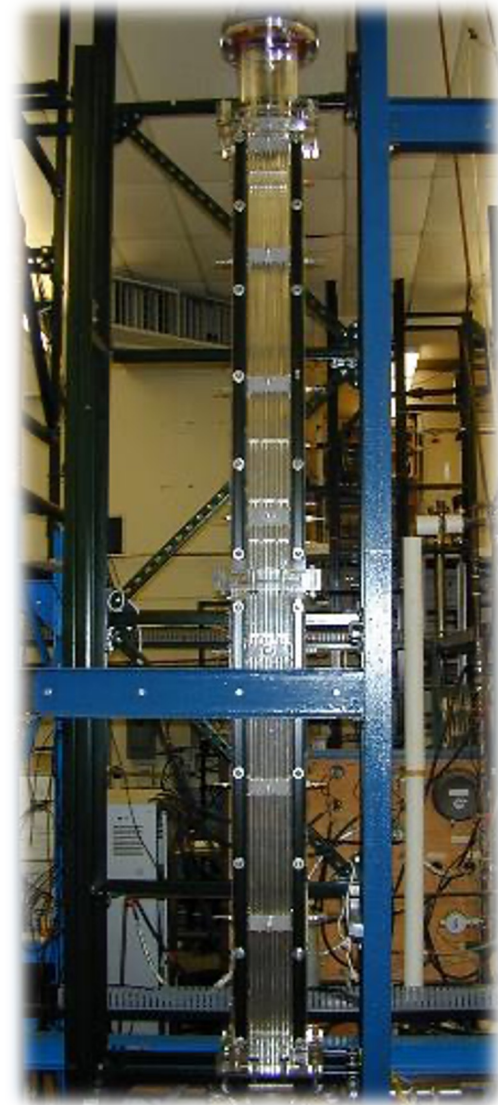


- Nuclear Fusion
- Nanolithography
- National Security
- Numerical Methods
- Biomedical



# *Mamoru Ishii - Walter H. Zinn Distinguished Professor*

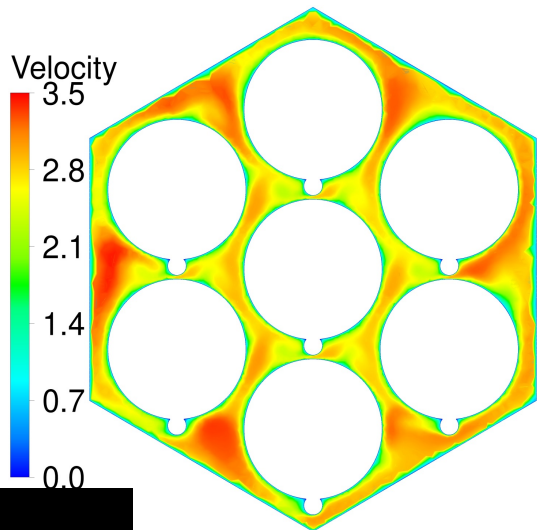
- Research in 3-D Two-phase Flow Modeling
- Research in Subcooled Boiling and CHF
- Two-fluid Model and Interfacial Area Transport
- 3-D Multigroup Two-phase Flow CFD Code
- Local Two-phase Flow and Boiling Instrumentation
- Integral Tests for LWR (PUMA, Natural Circulation BWR, Integrated PWR)
- Annular Flow Droplet, Entrainment and Film Dynamics
- Seismic Effects on Boiling Flow
- Small Modular BWR Design Development
- AI Use for Two-phase Flow Diagnostics
- Nuclear Reactor Security and Protection





# *Seungjin Kim - McCarthy Head and Professor*

- Fundamentals of Two-Phase Flow Transport
  - ✓ Geometric Effects: Elbows, Spacer Grids, U-bend
  - ✓ Orientation Effects: Horizontal, Inclined, Vertical Upward & Downward Flows
- Advanced Two-Phase Flow Instrumentation
- Artificial Intelligence Applications

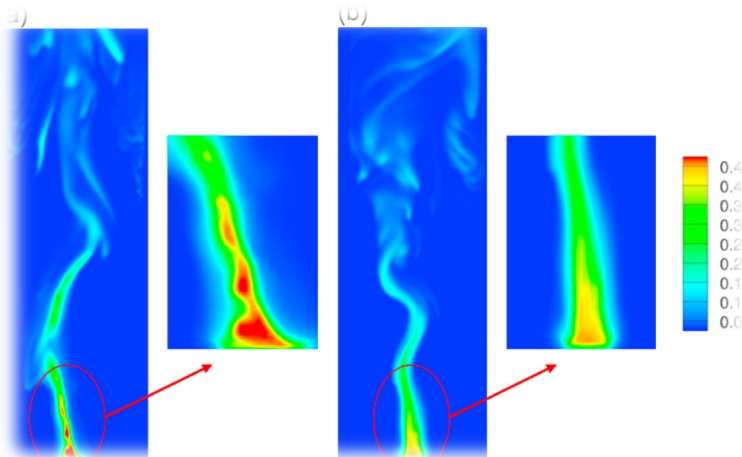
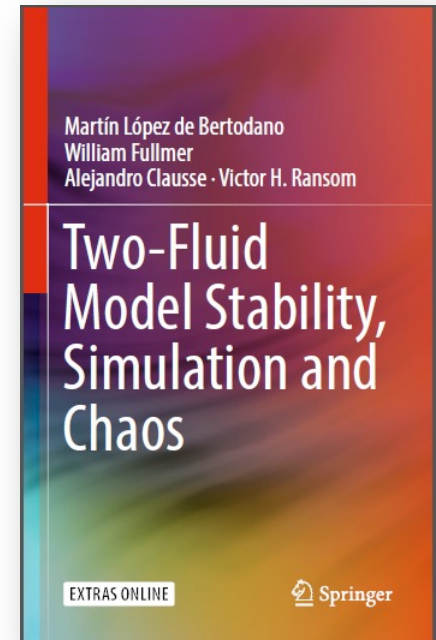


- Nuclear Reactor Safety and Analysis
  - ✓ Separate-effects \Experiments on Versatile Test Reactor (VTR)
  - ✓ Jet Impingement Model Evaluation/Development
- Computational Model Evaluation Development
  - ✓ VTR CFD Design Tool
  - ✓ Nuclear Reactor System Analysis Codes

# Martin Lopez-De-Bertodano - Associate Professor

## ■ Two-Fluid Model (TFM) STABILITY

- ✓ More physics instead of “fixes”
- ✓ Bubbly and stratified-wavy flows
- ✓ Linear stability: well-posed
- ✓ Nonlinear stability : Lyapunov
- ✓ Achieve **Verification** (convergence)



Bubble Plume: TFM void fraction contours  
(a) no collisions, (b) with collisions

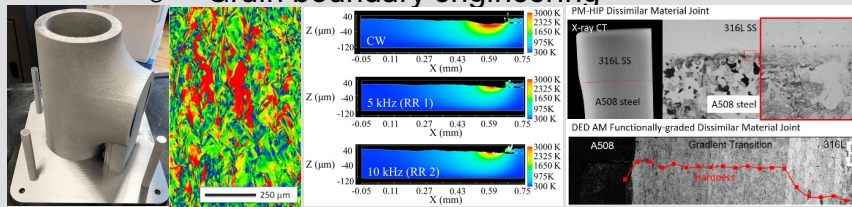
## ■ TFM CFD

- ✓ Bubbly flows in ducts
- ✓ Two-phase turbulence modeling
- ✓ RANS and URANS simulations

# Xiaoyun Lou - Associate Professor

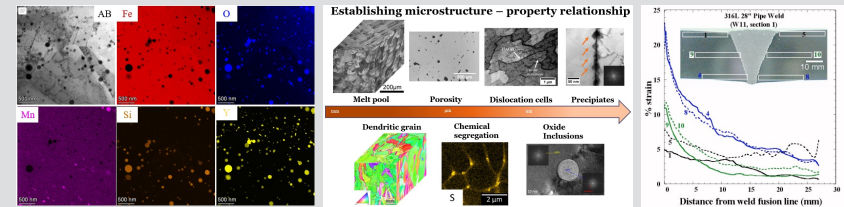
## Advanced Manufacturing

- Metal additive manufacturing
- Powder metallurgy-hot isostatic pressing
- Multi-material manufacturing
- Innovative manufacturing
  - Reactive additive manufacturing
  - Grain boundary engineering



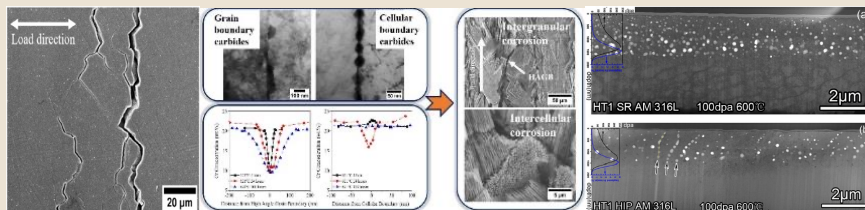
## Structural Materials

- Radiation and corrosion resistant steels
- Oxide dispersion alloys
- Weld metals
- Compositionally complex alloys
- Refractory alloys
- Nano composites



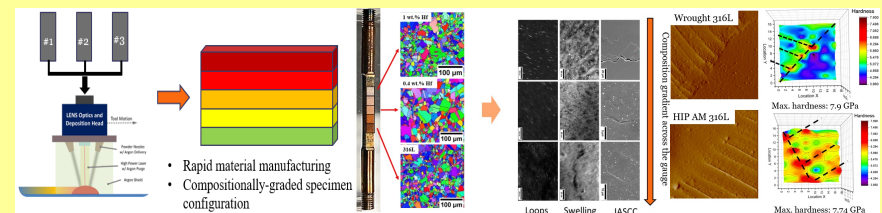
## Material Behavior in Extreme Environments

- Environmental assisted cracking
- Irradiated assisted stress corrosion cracking
- High temperature creep and creep-fatigue
- Radiation damage



## Innovative Testing and Characterization

- High-throughput alloy exploration
  - Gradient specimen synthesis and testing
  - Machine learning
- Mesoscale or microscale material testing and characterization

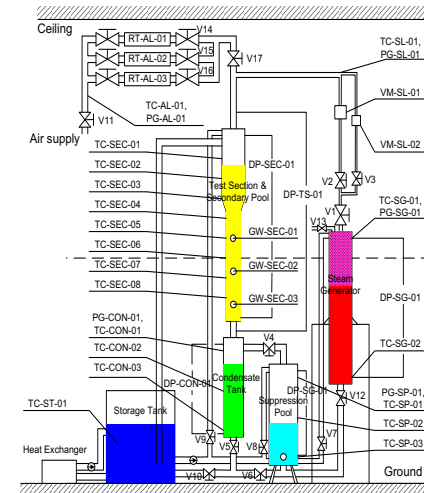
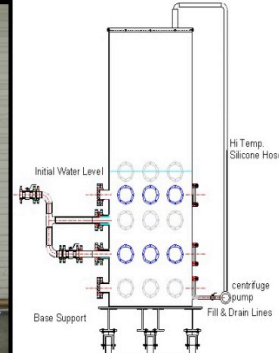
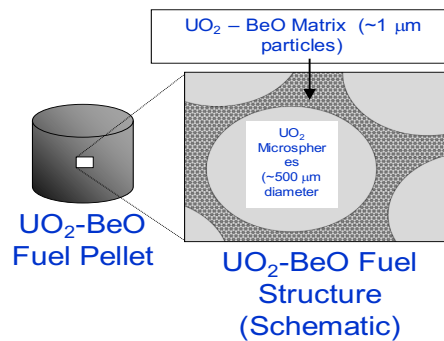
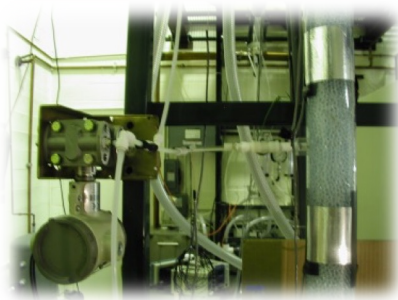


# Shripad Revankar - Professor

## Multiphase Flow and Fuel Cell Research Laboratory

### Reactor Thermal Hydraulics and Safety

Scaling, Integral and Separate Effects Tests, Fuels, Severe Accident Experiments, CFD, and System Analysis Code

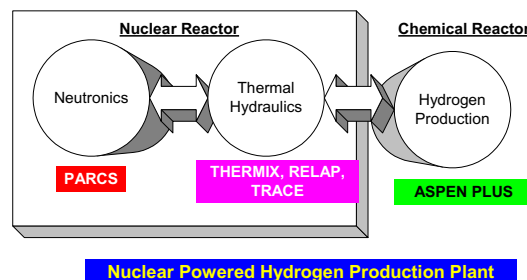


### Multi-phase Flow

Two-Phase Instrumentation, Porous Media Multiphase, Microgravity Multiphase

### Betavoltaic Cells

Tritium Loading on films, Betavoltaic Testing and Characterization



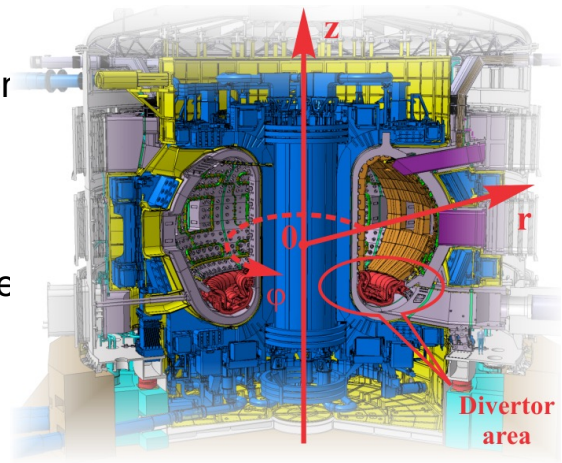
### Hydrogen, Fuel Cell, Hybrid Energy

Nuclear Thermochemical Hydrogen Generation, Chemical Hydrogen Storage, Fuel Cells, Regenerative Systems, Hybrid Power Sources, Solar Thermal Energy Storage, PCMs



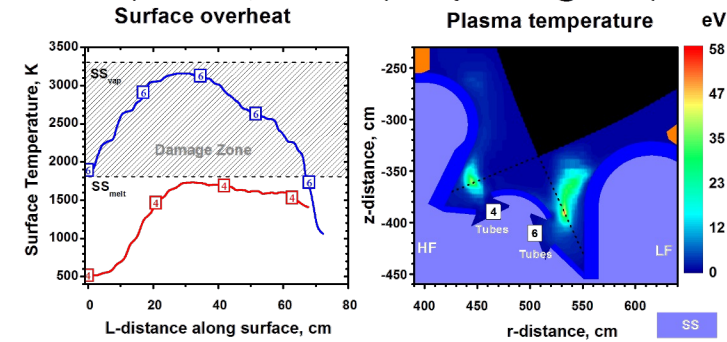
# Valeryi Sizyuk - Research Associate Professor

- The effects of using axial magnetic field in extreme ultraviolet photon sources for nanolithography
  - ✓ To study the angular distribution of extreme ultraviolet (EUV) photon output in plasmas produced in tin planar targets by a Nd:YAG laser
- Radiation energy recycling for enhancement of extreme ultraviolet photor sources in LPPs
  - ✓ To study recycling of both laser and resulting plasma-generated radiation and possible gains in conversion efficiency and/or power reduction over regular LPP devices when using droplets of tin target
- Heat loads to diverter nearby components from secondary radiation evolved during plasma instabilities
  - ✓ Simulation of Tokamak events in entire SOL using real reactor design



## Effect of Disruption on SS Tube Structures

DIS ( $\tau = 0.1$  ms,  $Q = 126$  MJ); Temperature @  $t = 14$   $\mu$ s



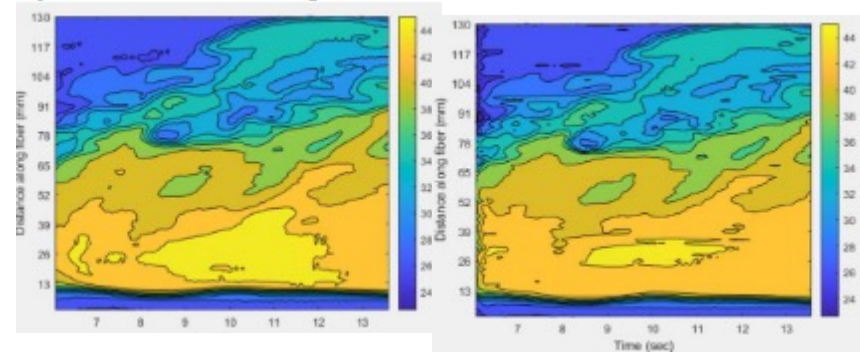
# *Rusi Taleyarkhan - Professor*

- Radiation sensor systems for special nuclear material monitoring, dosimetry, safe-guards/security environmental remediation, and nuclear energy applications.
- Green (VOC free) radiation-thermal tailored polymers for coatings/adhesives in auto, engineering composite woods-materials construction industries and radiation dosimetry.
- Nuclear reactor thermal-hydraulics and safety.
- Energetic materials, vapor explosion sciences for nuclear-non nuclear industries, super-cooling.
- Controlled hydrogen production; Nuclear material transmutation and synthesis.
- Metastable fluid sciences and radiation interactions for fundamental physics.
- Radiation interactions with matter and surface property tailoring.
- Acoustic inertial confinement thermonuclear fusion.

# *Lefteri H. Tsoukalas - Professor*

In collaboration with ANL, A/SL pursues:

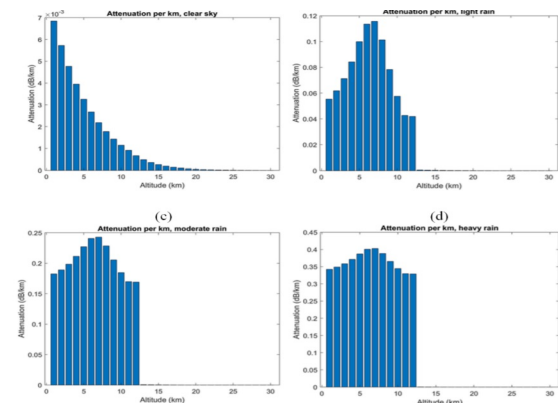
- Validation of point sensors in advanced reactors using long short-term memory networks
- Temporal and spatial validation of fiber optics distributed sensors using long short-term memory networks



- Physics-informed networks for the solution of stiff point PKEs for development of SMR digital twins

- Generative adversarial networks for generation of augmented data for thermocouple sensors time series

- Signal attenuation study in simulated microwave wireless channel using SeQUeNCe

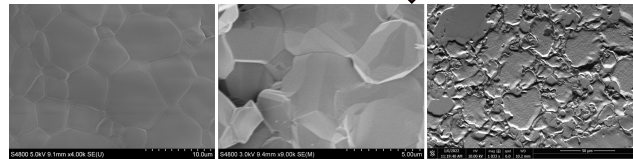
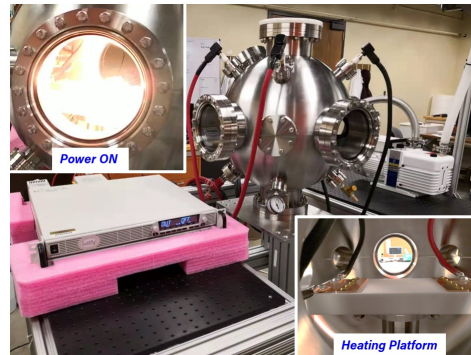


# Yi Xie - Assistant Professor

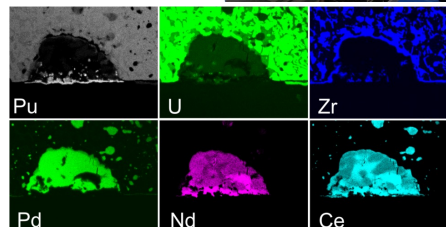
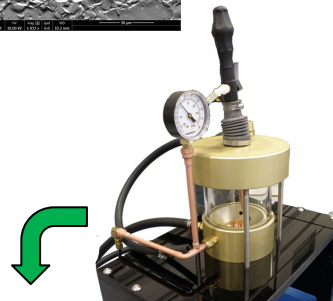
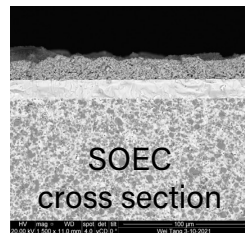
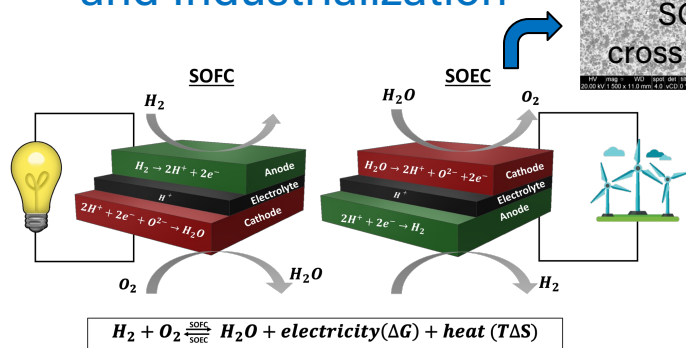
## Materials Innovation for Nuclear Energy (MINE)

### Advanced Manufacturing Technology Development

- Ultrafast heating
- High-throughput manufacturing
- Tunable microstructure and property
- Energy saving
- Cost effective

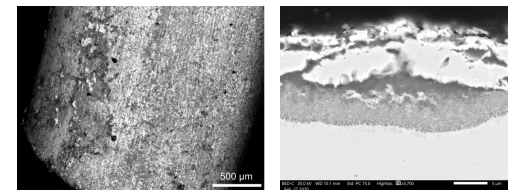


### Solid Oxide Cells Smart Manufacturing and Industrialization



### Environmental Degradation

- In-situ corrosion characterization
- Electrochemical corrosion technique
- Molten salt corrosion
- Light water reactor corrosion
- Sodium reactor corrosion



### Advanced Nuclear Fuels Development

- Accident tolerant fuels
- Metal fuels
- Accident tolerant control rods
- Characterization
- Performance investigation
- Design and development

# *Yunlin Xu - Assistant Professor*

- Nuclear Reactor Core Simulation Code Development
  - Maintenance of US NRC Code license code PARCS
  - Develop simulation capability for new types of reactors such as SFR.
  - PARCS hybrid Macro-Micro depletion
  - Adaptive time step control for transient simulation
- Coupled Neutronics/Thermal-hydraulics system code development
  - TRACE/PARCS development for SFR simulation support
  - Merging PARCS into RELAP5.
- National Laboratory Collaboration (ANL)
  - Improving Convergence of GPASS
- International Collaboration(Tsinghua University)
  - Innovative Whole Core Transport
  - Hybrid Parallel Transport Simulation
- Improve Region-wise Cross Section Generation from Monte-Carlo whole Core Simulation

# ***INTRODUCTIONS***

- Name
- Where are you from?
- What are your favorite things to do?
- What are your research area(s) of interest?

# Review of Additional Information

# ***GRADUATE SCHOOL***

[www.purdue.edu/gradschool](http://www.purdue.edu/gradschool)

Young Hall, Room 170

765-494-2600

- Manage Transcripts
- Assist with Late Registration
- Process Grade Changes



# ***REGISTRAR***

[www.purdue.edu/registrar](http://www.purdue.edu/registrar)

Stewart Center, Suite 176

765-494-8581

- Manage Transcripts
- Assist with Late Registration
- Process Grade Changes

# ***BURSAR***

[www.purdue.edu/bursar](http://www.purdue.edu/bursar)

Stewart Center, Room 194

765-494-7570

- Pay fees  
(<http://mypurdue.purdue.edu>)
- Applies Financial Aid to Student Accounts
- Administers Deferred Fee Billing Plans

## Responsible Conduct of Research (RCR) Training

- Every graduate student in the School of Nuclear Engineering is required to complete the on-line Collaborative Institutional Training Initiative's (CITI) Responsible Conduct of Research (RCR) training program within 60 days of starting a graduate program and every five (5) years thereafter.
- Details on the CITI training can be found at: <https://about.citiprogram.org/en/series/responsible-conduct-of-research-rcr/>.
- Each graduate student must submit a certificate of completion for the CITI training to the Student Services Office by the last day of classes in their first semester in order to receive a grade of "Satisfactory" for the seminar course. The certificate of completion will be retained in the student's file.

## Graduate Staff Employment

- Governed by  
Graduate Staff Employment Manual  
Updated: January 19, 2023

<https://www.purdue.edu/gradschool/documents/gpo/graduate-student-employment-manual.pdf>

## FERPA Certification

- Family Education Rights and Privacy Act
- If you are a grader and/or a TA at any point, you MUST be FERPA certified
- <http://www.eventreg.purdue.edu/webcert>
- Permission to Transmit Information Form  
[www.purdue.edu/registrar](http://www.purdue.edu/registrar)
- 765-494-8219

## ORAL ENGLISH PROFICIENCY TEST (OEPT)

- Before being appointed to a teaching assistant position, a student must be certified by one of the accepted methods (Oral English Proficiency Test or performance in ENGL 62000)
- Students should work with Student Service Office (nucless@purdue.edu) to register and prepare for the OEPT and, if necessary, enroll in ENGL 62000.
- ENGL 62000 is an English as a second language course in oral communication exclusively for non-native, English-speaking TA's.
- The OPET is a computer-based test used by the OEPP to screen prospective TAs for English language proficiency. While taking the test, candidates respond to a variety of questions, present information and speak extemporaneously on a range of topics. The responses are recorded and evaluated by at least two trained raters.
- A score of 50 or higher is required for certification.

# *Nuclear Engineering*

## OEPT: Certification Methods

| Test                                 | Minimum Scores Accepted for Oral English Certification |
|--------------------------------------|--|
| Oral English Proficiency Test        | 50   |
| TOEFL iBT (speaking sub-score)       | 27   |
| IELTS (speaking band score)          | 8.0  |
| PTE (speaking sub-score)             | 76   |
| TOEFL (computer or paper based test) | Not Accepted for Oral English certification            |
| Test of Written English              | Not Accepted for Oral English certification            |
| SPEAK (from other institutions)      | Not Accepted for Oral English certification            |

## REGISTERING for OEPT

If your major professor asks that you TA for a course or be a grader, and you are not automatically certified from your TOEFL or IELTS scores, please:

- Visit the OEPP website ([www.purdue.edu/oepp](http://www.purdue.edu/oepp))
- Find 2 exam time periods that work for you
- Email Student Service Office ([nucless@purdue.edu](mailto:nucless@purdue.edu)) with the exam dates
- Take the practice exam



# REQUIREMENTS for the PROGRAM

Graduate Manual, Plan of Study and Registration

# *Nuclear Engineering*

## NE Graduate Manual

### July 2023 Edition

- Contains supplementary regulations and procedures that are specific to the School of Nuclear Engineering.
- It is not intended to replace information, regulations, or procedures contained in the Graduate School's "Policies and Procedures Manual for Administering Graduate Student Programs" or other University or Graduate School publications.
- In the event of conflict, the Graduate School and/or University regulations shall prevail over School policies.

## CHOOSING an ADVISOR (and Committee)

- A person who can guide your research
- Usually the person providing funding
- Often determined before you arrive – if not, conduct a careful search
- Work with your advisor to choose your committee
- For additional information or questions – Interim Grad Chair (Prof. Tsoukalas Email/ meet /appointment)
- If there is a certain faculty member you want to meet with, e-mail them to make appointment

## PLAN of STUDY:

### Master's Students and PhD Students

Directions are in your supplied material for how to complete the Plan of Study

- Purdue University Graduate School  
[www.purdue.edu/GradSchool](http://www.purdue.edu/GradSchool)

- NE Graduate Manual July 2023

[https://engineering.purdue.edu/NE/for  
you/graduate/NE%20Graduate%20Ma  
nual%20Fall%202020](https://engineering.purdue.edu/NE/for%20you/graduate/NE%20Graduate%20Manual%20Fall%202020)

## CORE CURRICULUM - Master's Students

### Nuclear Engineering Graduate Manual

- 5 Core Courses ( 3 credits each) : NUCL 501 (Intro), NUCL 504 (Radiation), NUCL 510 (Reactor Physics), NUCL 520 (Reactor Materials) and NUCL 551 (Thermal Hydraulics)
- 2 additional courses ( 3 credits each) of Math or Computer Science or other approved computational course
- Students who have not received a Bachelor of Science in Nuclear Engineering at Purdue **MUST** take NUCL 501
- Student who did not get an Undergraduate BSNE from Purdue **MUST** take NUCL 504
- Total 30 Credits hours are required
  - Thesis Based: 24 course credit hours ( 500 or 600 level) + 6 credit hours research
  - Course Based (non-thesis) : 30 total course credit hours

## CORE CURRICULUM - PhD Students

### Nuclear Engineering Graduate Manual

- Core Courses: NUCL 501 (Intro), NUCL 504 (Radiation), NUCL 510 (Reactor Physics), NUCL 520 (Reactor Materials) and NUCL 551 (Thermal Hydraulics)
- 2 additional courses ( 3 credits each) of Math or Computer Science or other approved computational course
- Students who have not received a Bachelor of Science in Nuclear Engineering at Purdue **MUST** take NUCL 501
- Student who did not get an Undergraduate BSNE from Purdue **MUST** take NUCL 504
- 90 total credit hours are required to graduate
  - 48 credits hours of graduate coursework ( 500 and 600 level courses)
  - Minimum 3 courses 600 level
  - 42 credits hours of research

## REGISTRATION FORM 23 (Schedule Revision Request)

1. PUID
2. Name
3. Term (Fall 2023)
4. College (College of Engineering or CoE)
5. Program (Nuclear Engineering or NE)
6. Classification (Graduate Student or GR)
7. Add (A); Drop (D); Modify (M)
8. CRN (Course Request Number / 5 digit number)
9. Subject (NUCL)
10. Course Number
11. Credits
12. Faculty Advisor Signature
13. Student Signature

- ❖ Complete Form 23 found in MyPurdue
- ❖ Submit the Form 23 to Nuclear Grad student service office: [nucless@purdue.edu](mailto:nucless@purdue.edu)
- ❖ Once you are registered, you will receive an email to review your registration

# Nuclear Engineering

## Fall 2023 REGISTRATION CALENDAR August 21, 2023 – First Day of Class

Calendar for course add or modify, and drop

<https://www.purdue.edu/registrar/calendars/>

### TO ADD or MODIFY or CHANGE A GRADE MODE for a COURSE

| 16 Weeks                             | 1 <sup>st</sup> 8 Weeks | 2 <sup>nd</sup> 8 Weeks | AUTHORIZATIONS REQUIRED  |
|--------------------------------------|-------------------------|-------------------------|--|
| Aug 21 – Aug 25<br><b>Week 1</b>     | Aug 21 – Aug 22         | Oct 18 – Oct 19         | (COURSE SPACE AVAILABILITY REQUIRED)<br>Students may add courses via Scheduling Assistant                                |
| Aug 26 – Sep 18<br><b>Week 2 - 4</b> | Aug 23 – Sep 1          | Oct 20 – Oct 31         | Advisor and Instructor<br><b>Submit request via the Scheduling Assistant</b>   |
| Sep 1                                | Aug 25                  | Oct 24                  | Last day to audit a course, <b>submit change of grade mode to Audit after officially enrolled</b>                        |
| Sep 19 – Oct 24<br><b>Week 5 - 9</b> | Sep 2 – Sep 20          | Nov 1 – Nov 17          | Advisor, Instructor, and Head of Department in which the course is listed.<br><b>Submit via the Scheduling Assistant</b> |

### TO DROP A COURSE

| 16 Weeks                              | 1 <sup>st</sup> 8 Weeks | 2 <sup>nd</sup> 8 Weeks | AUTHORIZATIONS REQUIRED   |
|---------------------------------------|-------------------------|-------------------------|---|
| Aug 21 – Sep 1<br><b>Weeks 1 - 2</b>  | Aug 21 – Aug 25         | Oct 18 – Oct 24         | No authorizations required (Course not recorded)<br>Students may drop courses via Scheduling Assistant.   |
| Sep 2 – Sep 18<br><b>Weeks 3 - 4</b>  | Aug 26 – Sep 1          | Oct 25 – Oct 31         | Advisor (Course recorded with a grade of "W")<br><b>Submit request via Scheduling Assistant</b>   |
| Sep 19 – Oct 24<br><b>Weeks 5 - 9</b> | Sep 2 – Sep 20          | Nov 1 – Nov 17          | Advisor. Instructor (Instructor shall indicate whether passing or failing.) Grades of "W", "WF", or "WN" will be recorded. Students with a semester classification of 1 or 2 do not require response from instructor; grades will be "W". <b>Submit via Scheduling Assistant.</b> |



# Questions

**Additional Presentations  
are available at**  
<https://engineering.purdue.edu/NE/foryou/graduate>

# ***Nuclear Engineering***

- **Information and Library Search Skills**
- **Ethics, Responsible Conduct of Research and iThenticate Program**
- **Academic Integrity**
- **Business office-Student Payroll**
- **Student Organizations**
  - Women in Engineering Programs (WIEP)
  - Women in Nuclear Engineering
  - Nuclear Engineering Graduate Organization
  - American Nuclear Society
  - Alpha Nu Sigma
  - Purdue Graduate Student Government (PGSG)

# *Nuclear Engineering*

<https://engineering.purdue.edu/NE/foryou/graduate>

- **College of Engineering Information**
- [Required: Graduate Student Responsible Conduct of Research \(RCR\) \(PDF\)](#)
- [Introduction to Funding \(PDF\)](#)
- [Apply for Fellowships & Scholarships \(PDF\)](#)
- [Mentoring: For Graduate School and Beyond \(PDF\)](#)
- [Engineering Academic Career Club \(EACC\) \(Image\)](#)
- [Graduate Mentoring Program from the Women in Engineering Program \(Video\)](#)
- **Presentation Slide Downloads**
- [New Graduate Student Orientation \(PDF\)](#)
- [Research Integrity Office \(PDF\)](#)
- [Academic Integrity & You: Graduate Edition \(PDF\)](#)
- [Orientation to the Purdue Libraries & School of Information Studies \(PDF\)](#)
- [ECN \(Engineering Computer Network\) \(PDF\)](#)
- Videos: Research Integrity Office and NEGO

# *Additional information from College of Engineering*

**Website:** [www.engr.purdue.edu/grad](http://www.engr.purdue.edu/grad)

**YouTube:**

<https://www.youtube.com/c/PurdueEngineeringGraduatePrograms>

**Twitter:** @PurdueGradEngr

- Counseling and Psychological Services (**CAPS**) Liaisons to CoE

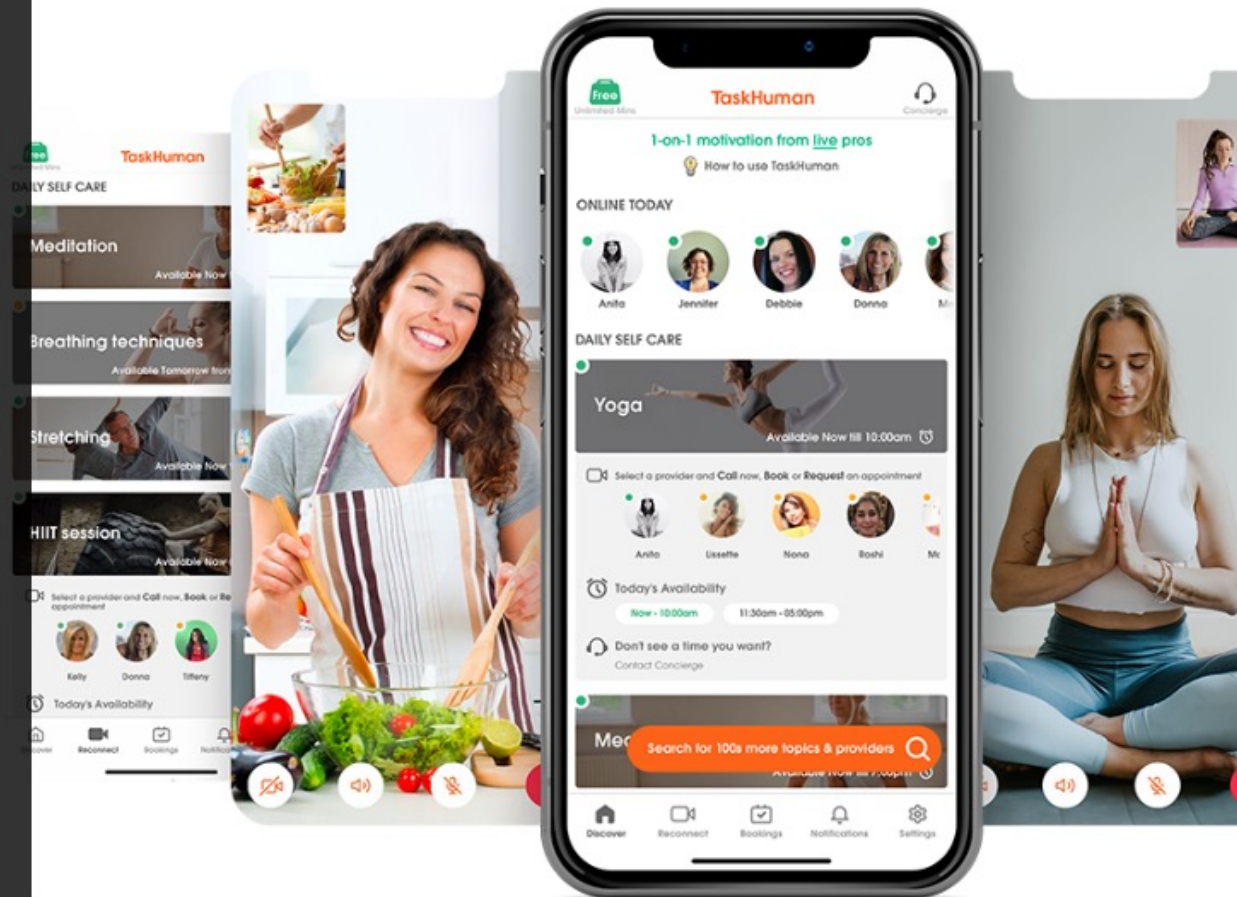
<https://engineering.purdue.edu/Engr/Bloom/CAPS-Liaisons-Engineering>

- Graduate Student Center Lounge, kitchen, study rooms, multi-purpose room, and more!
- The Co-Rec
  - 2 swimming pools and diving well
  - Climbing & bouldering wall
  - 2 indoor tracks, courts, martial arts, fitness classes, cooking classes
  - Intramural & club sports

# *Task Human Resource for Wellness*

## Purdue College of Engineering Wellness

In addition to the rich **Purdue wellness programs** already available to you, Purdue College of Engineering has partnered with TaskHuman, a mobile app that helps you achieve your personal wellness goals!



<https://engineering.purdue.edu/Engr/Bloom/TaskHuman>

# *New Changes to Health Insurance Benefits This Semester*

- United Healthcare is the new benefits provider for graduate staff.
  - Graduate Staff Enrollment
    - **Note:** During this transition period for the first 12-months of coverage, UHCSR will pay out of network claims the same as in-network (if a claim processes out-of-network, then it will be reprocessed as in-network through the appeal process during this period).
      - If the out-of-network provider is identified before the claim processes, UHCSR will flag that provider to process as in-network and process the claim accordingly.
  - Here is a list of mental health providers
  - For questions or concerns about UHCSR, please contact [hr@purdue.edu](mailto:hr@purdue.edu)
- We also encourage you to use the Engineering Graduate Student Anonymous Reporting Tool so that the Office of Graduate Education can continue to support you!



# *Helpful Resources to Know About*

- **Did You Know?** – *The Graduate School's brand-new one-stop location for a multitude of resources!*
- Engineering Computer Network (ECN) – Knowledge Base
- Information Technology at Purdue (ITaP) – GoldAnswers
- International Students and Scholars (ISS)
- Oral English Proficiency Program (OEPP)
- Cultural Centers, Networks, & Resources
  - Graduate Student-Specific Organizations
- ACE Campus Food Pantry
- CityBus Website & App
- Purdue Recreation & Wellness (RecWell)
- ***Not sure where to turn with an issue?*** Reach out to The Graduate School Ombuds Services!

***THANK YOU***