



Faculty Directory

**Amrita Basak**

Ph.D., Georgia Institute of Technology, 2017
Assistant Professor of Mechanical Engineering
233 Reber
814-863-1323 / aub1526@psu.edu
Research interests: Sensors and controls

**Ashok D. Belegundu**

Ph.D., The University of Iowa, 1982
Professor of Mechanical Engineering
330 Leonhard / 814-863-2115 / adb3@psu.edu
Research interests: Optimization; finite elements; mechanics

**Catherine Berdanier**

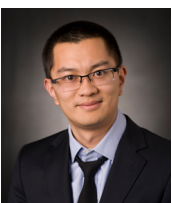
Ph.D., Purdue University, 2016
Assistant Professor of Mechanical Engineering
206 Reber / 814-865-0040 / cgb9@psu.edu
Research interests: Cognitive research for engineering education applications; engineering writing; graduate engineering attrition and persistence

**Sean N. Brennan**

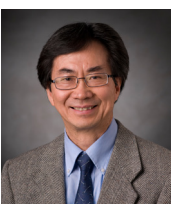
Ph.D., University of Illinois at Urbana-Champaign, 2002
Professor of Mechanical Engineering
157E Hammond / 814-863-2430 / sbrennan@psu.edu
Research interests: Vehicle dynamics and automation; ground robotics; human-in-the-loop and hardware-in-the-loop; sensing and control utilizing big data

**Margaret Byron**

Ph.D., University of California, Berkeley, 2015
Assistant Professor of Mechanical Engineering
301A Reber / 814-863-0736 / mzb5025@psu.edu
Research interests: Experimental fluid dynamics; turbulence; multiphase flows; biomechanics of swimming at intermediate Reynolds number

**Bo Cheng**

Ph.D., Purdue University, 2012
Assistant Professor of Mechanical Engineering
338B Reber / 814-867-5963 / buc10@psu.edu
Research interests: Animal locomotion; biomechanics; biologically inspired robotics; experimental fluid dynamics; control

**Fan-Bill Cheung**

Ph.D., University of Notre Dame, 1974
George L. Guillet Professor of Mechanical and Nuclear Engineering
304 Reber / 814-863-4261 / fxc4@psu.edu
Research interests: Solidification and melting; turbulent natural convection; two-phase flow and heat transfer; nuclear reactor thermal hydraulics and safety

**Sukwon Choi**

Ph.D., Georgia Institute of Technology, 2013
Assistant Professor of Mechanical Engineering
306 Reber / 814-863-4355 / sfc5185@psu.edu
Research interests: Micro/nanoscale thermal characterization; multi-physics analysis of microelectronics and MEMS; wide band gap semiconductor devices; thermal management of microelectronics; semiconductor device reliability

**John M. Cimbala**

Ph.D., California Institute of Technology, 1984
Professor of Mechanical Engineering
234 Reber / 814-863-2739 / jmc6@psu.edu
Research interests: Experimental and computational fluid dynamics and heat transfer; turbomachinery; hydropower; air pollution control; indoor air quality; aerosol particle motion; turbulence modeling; flow visualization; neutron radiography

**Daniel H. Cortes**

Ph.D., West Virginia University, 2009
Assistant Professor of Mechanical Engineering
329 Leonhard / 814-863-3103 / dhc13@psu.edu
Research interests: Diagnosis of injuries and evaluation of treatments in orthopaedic tissues by combining tissue biomechanics, numerical modeling, and medical imaging

**Jing Du**

Ph.D., Princeton University, 2012
Assistant Professor of Mechanical Engineering
316B Leonhard / 814-863-1043 / jingdu@psu.edu
Research interests: Solid mechanics; fracture mechanics; biomechanics; biomaterials; bio-inspired design; medical devices; electronic devices

**Brian Foley**

Ph.D., University of Virginia, 2016
Assistant Professor of Mechanical Engineering
326 Reber / 814-863-5821 / bxf303@psu.edu
Research interests: Micro/nanoscale energy transport and material property characterization; thermal devices & circuits; RF/MW/THz/optical properties of materials; opto/electro-thermal metrology; plasmonics

**Mary Frecker**

Ph.D., University of Michigan, 1997
Professor of Mechanical Engineering
Associate Department Head for Graduate Programs
326 Leonhard, 127 Reber
814-865-1617, 814-865-1345 / mxf36@psu.edu
Research interests: Optimal design; compliant mechanisms; smart structures and actuators; medical devices; origami engineering

**Aman Haque**

Ph.D., University of Illinois at Urbana-Champaign, 2002
 Professor of Mechanical Engineering
 317A Leonhard / 814-865-4248 / mah37@psu.edu
Research interests: Micro and nanoelectromechanical systems; energy harvesting; nanoscale materials (mechanical, thermal, and electrical) behavior; electron microscopy

**Daniel C. Haworth**

Ph.D., Cornell University, 1986
 Professor of Mechanical Engineering
 140 Research East / 814-863-6269 / dch12@psu.edu
Research interests: Computational thermal-fluids sciences including fluid mechanics, turbulence, combustion, numerical methods, IC engines, and transportation propulsion systems

**Reuben Kraft**

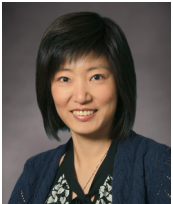
Ph.D., Johns Hopkins University, 2008
 Associate Professor of Mechanical Engineering
 320 Leonhard / 814-867-4570 / rhk12@psu.edu
Research interests: Computational biomechanics; high-strain-rate response of materials; mechanobiology; brain science and injury

**Anil K. Kulkarni**

Ph.D., Brown University, 1980
 Professor of Mechanical Engineering
 205 Reber / 814-865-7073 / akk@psu.edu
Research interests: Combustion; fluid mechanics; heat transfer

**Robert Kunz**

Ph.D., Penn State, 1991
 Professor of Mechanical Engineering
 301C Reber / 814-865-2144 / rkf102@psu.edu
Research interests: Computational fluid dynamics; multiphase flows; turbomachinery; nuclear reactor thermal-hydraulics

**Siu Ling Leung**

Ph.D., University of Arizona, 2013
 Director of Undergraduate Laboratories
 323 Reber Building
 814-863-1653 / szl12@psu.edu

**Thomas A. Litzinger**

Ph.D., Princeton University, 1986
 Professor of Mechanical Engineering; Director of The Leonhard Center for the Enhancement of Engineering Education; Assistant Dean for Educational Innovation and Accreditation
 201 Hammond / 814-865-4015 / tal2@psu.edu
Research interests: Combustion; emissions; gas turbines; rockets; problem solving; learning

**Stephen Lynch**

Ph.D., Virginia Polytechnic Institute and State University, 2011
 Shuman Family Early Career Professor of Mechanical Engineering
 331 Reber / 814-867-4768 / spl11@psu.edu
Research interests: Turbomachinery aerodynamics and heat transfer; convective heat transfer; experimental diagnostic equipment for laminar-turbulent transition; turbulent boundary layers

**Joseph Najem**

Ph.D., Virginia Tech, 2015
 Assistant Professor of Mechanical Engineering
 327 Leonhard Building / jsn5211@psu.edu
Research interests: Research interests: Bioinspired smart materials; Biomolecular materials; Biophysics; Emergent behavior

**Guha Manogharan**

Ph.D., North Carolina State University, 2014
 Assistant Professor of Mechanical Engineering
 232 Reber / 814-863-7273 / gum53@psu.edu
Research interests: Additive manufacturing - design and materials; hybrid manufacturing; biomedical applications for additive manufacturing; metal casting - 3D sand printing

**Eric Marsh**

Ph.D., Massachusetts Institute of Technology, 1994
 Professor of Mechanical Engineering
 Associate Department Head of Undergraduate Programs
 140B Reber / 814-863-1503 / erm7@psu.edu
Research interests: Precision engineering; machine dynamics; manufacturing

**Anne Martin**

Ph.D., University of Notre Dame, 2014
 Assistant Professor of Mechanical Engineering
 338C Reber / 814-863-4114 / aem34@psu.edu
Research interests: Robotic controls; modeling human gait; improving impaired locomotion; predictive modeling; dynamics of rigid bodies

**Jessica Menold**

Ph.D., Penn State, 2017
 Assistant Professor in The School of Engineering Design, Technology, and Professional Programs, and Assistant Professor of Mechanical Engineering
 213V Hammond / 814-863-6621 / jdm5407@psu.edu
Research interests: Engineering design and new product development; prototyping theory and technologies; design thinking; prosthetic design; mass customization for emerging markets

**Jean-Michel Mongeau**

Ph.D., University of California, Berkeley, 2013
 Assistant Professor of Mechanical Engineering
 204 Reber Building / 814-865-7842 / jmm1175@psu.edu
Research interests: Neural and mechanical control of animal locomotion; biological system identification; sensing; bio-inspired engineering; robots as tools to study control of locomotion

**Jason Moore**

Ph.D., University of Michigan, 2010
 Assistant Professor of Mechanical Engineering
 318 Leonhard / 814-865-1749 / jzm14@psu.edu
Research interests: Medical device design; tissue cutting mechanics; tissue dynamics

**Gary Neal**

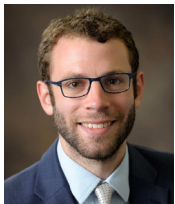
Instructor in Mechanical Engineering
 314A Leonhard / 814-863-5468 / gln103@psu.edu
Research interests: Advanced automotive propulsion system integration, design, and optimization; hybrid electric vehicle design; energy storage system design; transportation energy use optimization; project and personnel management; underwater weapons; drivetrain technology

**Jacqueline O'Connor**

Ph.D., Georgia Institute of Technology, 2012
 Associate Professor of Mechanical Engineering
 111 Research East / 814-863-1502 / jxo22@psu.edu
Research interests: Gas turbine and diesel engine combustion; combustion instability; hydrodynamic stability; diesel sprays and flow-fields; engine emissions control; high-speed laser diagnostics for combustion applications

**Zoubeida Ounaies**

Ph.D., Penn State, 1996
 Professor of Mechanical Engineering
 Associate Department Head of Administration
 157B Hammond / 814-867-4443 / zxo100@psu.edu
Research interests: Structures-property relationships of functional polymers and polymer nanocomposites with unique combinations of mechano-electro-thermal coupling; boundary layer stability

**Herschel Pangborn**

Ph.D., University of Illinois at Urbana-Champaign, 2019
 Assistant Professor of Mechanical Engineering
 hxp5027@psu.edu
Research interests: Dynamic systems and control; energy management in vehicles and buildings; modeling and optimization of electro-thermal systems; predictive and distributed/hierarchical control; switched systems

**Matthew Parkinson**

Ph.D., University of Michigan, 2004
 Associate Professor of Engineering Design and Mechanical Engineering, Interim Director of the Bernard M. Gordon Learning Factory
 213 Hammond / 814-863-9079 / parkinson@psu.edu
Research interests: Biomechanics; biomedical design; ergonomics; rehabilitation engineering; motion modeling and prediction; optimization; product platform; mechanical design

**Laura L. Pauley, P.E.**

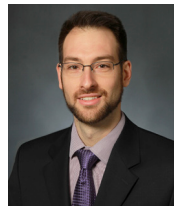
Ph.D., Stanford University, 1988
 Professor of Mechanical Engineering
 305 Reber / 814-863-4259 / llp1@psu.edu
Research interests: Computational fluid dynamics; unsteady separated flows; boundary layer stability

**Christopher Rahn**

Ph.D., University of California, Berkeley, 1992
 Professor of Mechanical Engineering, Co-director of BEST, Associate Dean of Innovation
 150A Hammond / 814-865-6237 / cdrahn@psu.edu
Research interests: Dynamic systems modeling; design, analysis, and control with application to flexible structures; biologically inspired robotics; smart material actuators; sensors and energy harvesters; electrochemical energy storage

**Bladimir Ramos-Alvarado**

Ph.D., Georgia Institute of Technology, 2016
 Assistant Professor of Mechanical Engineering
 301D Reber / 814-865-7557 / bzm52@psu.edu
Research interests: Solid-liquid interfacial phenomena at the nanoscale (atomistic modeling of wettability, friction, and heat transfer); transport phenomena and electrochemistry in PEM fuel cells; active-liquid cooling of electronics; thermal characterization of microelectronics; CFD modeling

**Alexander Rattner**

Ph.D., Georgia Institute of Technology, 2015
 Assistant Professor of Mechanical Engineering
 236A Reber / 814-863-4387 / asr20@psu.edu
Research interests: Sustainable thermal-fluid energy systems; waste heat recovery; multiphase flow heat and mass transfer; high performance computing

**Matthew Rau**

Ph.D., Purdue University, 2016
 Assistant Professor of Mechanical Engineering
 301B Reber / 814-863-4590 / mjr79@psu.edu
Research interests: Two-phase flow and heat transfer; multiphase flow turbulence; particle dynamics; aggregation and carbon transport in the ocean; 3D particle image velocimetry; flow visualization; infrared thermography

**Asok Ray, P.E.**

Ph.D., Northeastern University, 1976
 Distinguished Professor of Mechanical Engineering, Electrical Engineering, Mathematics, and Nuclear Engineering
 329 Reber / 814-865-6377 / axr2@psu.edu
Research interests: Optimization and control of continuously-varying and discrete-event dynamical systems; stochastic modeling and estimation of nonlinear processes; signal decomposition; intelligent instrumentation

**Timothy Simpson**

Ph.D., Georgia Institute of Technology, 1998
 Professor of Mechanical Engineering and Paul Morrow Professor in Engineering Design and Manufacturing
 209 Leonhard / 814-863-7136 / tws8@psu.edu
Research interests: Engineering design and design optimization; product family and product platform design; mass customization; multi-dimensional visualization; surrogate modeling

**Alok Sinha**

Ph.D., Carnegie Mellon University, 1983
 Professor of Mechanical Engineering
 330 Reber / 814-863-3079 / axs22@psu.edu
Research interests: Vibration; control systems; nanomechanics; diagnostics and prognostics of dynamic systems; jet engines

**H. Joseph Sommer III**

Ph.D., University of Illinois at Urbana-Champaign, 1980
 Professor of Mechanical Engineering
 337 Leonhard / 814-863-8997 / hjs1@psu.edu
Research interests: Kinematics; robotics; machine vision; biomechanics; unmanned aircraft

**Karen A. Thole**

Ph.D., The University of Texas at Austin, 1992
 Department Head and Distinguished Professor
 136 Reber / 814-865-2519 / kthole@psu.edu
Research interests: Convective heat transfer; gas turbine heat transfer; use of additive manufacturing for novel cooling

**Stefan T. Thynell**

Ph.D., North Carolina State University, 1986
 Professor of Mechanical Engineering
 114 Research East / 814-863-0977 / thynell@psu.edu
Research interests: Ignition and combustion of propellants; thermal decomposition of liquid and solid energetic materials; FT-IR spectroscopy and time-of-flight mass spectrometry; thermal radiation

**Martin W. Trethewey**

Ph.D., Michigan Technology University, 1981
 Arthur L. Glenn Professor of Mechanical Engineering
 336 Leonhard / 814-865-1961 / mwtme@psu.edu
Research interests: Machine dynamics; signal processing; condition based machine diagnostics; experimental modal analysis; vibrations; noise control; product design

**Adri van Duin**

Ph.D., Delft University of Technology, The Netherlands, 1996
 Professor of Mechanical Engineering
 240 Research East / 814-863-6277 / acv13@psu.edu
Research interests: Atomistic-scale simulations of chemical reactions; reactive force fields (ReaxFF); quantum chemistry; combustion reactions; interface chemistry; organic geochemistry

**Paris von Lockette**

Ph.D., The University of Michigan, Ann Arbor, 1999
 Associate Professor of Mechanical Engineering
 338A Reber / 814-865-2761 / prv2@psu.edu
Research interests: Mechanics of multi-field active structures and devices; microstructure property relationships in active nonlinear composites; magneto-active elastomers for self-locomotion; compliant actuation; origami engineering

**Chao-Yang Wang**

Ph.D., The University of Iowa, 1994
 William E. Diefenderfer Chair of Mechanical Engineering, Director of Electrochemical Center, Co-director of BEST
 162 Energy and the Environment Laboratory
 814-863-4762 / cxw31@psu.edu
Research interests: Fuel cells and batteries; multiphase transport; modeling and diagnostics

**Donghai Wang**

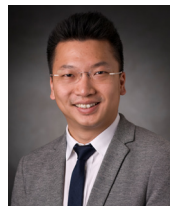
Ph.D., Tulane University, 2006
 Professor of Mechanical Engineering
 134 Energy and the Environment Laboratory
 814-863-1287 / duw13@psu.edu
Research interests: Design and synthesis of nanostructured functional materials; clean energy technologies including batteries, solar cell, and fuel cell

**Qian Wang**

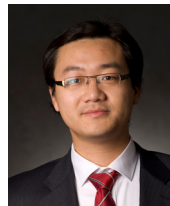
Ph.D., Princeton University, 2001
 Professor of Mechanical Engineering
 325 Leonhard / 814-865-8281 / quw6@psu.edu
Research interests: Robust control; nonlinear control; modeling and control for additive manufacturing processes; type-1 diabetes; thermal comfort modeling and control for buildings

**David Williams**

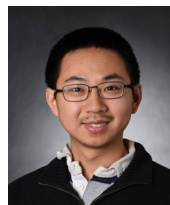
Ph.D., Stanford University, 2013
 Assistant Professor of Mechanical Engineering
 328 Reber / 814-863-2181 / dmw72@psu.edu
Research interests: Computational fluid dynamics; external aerodynamics; finite element analysis; high-order methods; solution-adaptive meshing

**Tak-Sing Wong**

Ph.D., University of California, Los Angeles, 2009
 Early Career Associate Professor of Mechanical Engineering
 N330 Millenium Science Complex
 814-865-6122 / tuw17@psu.edu
Research interests: Biomimicry and bioinspired engineering; micro- and nanomanufacturing; surface and interfacial engineering

**Yuan Xuan**

Ph.D., California Institute of Technology, 2014
 Assistant Professor of Mechanical Engineering
 106 Research East / 814-865-2165 / yux19@psu.edu
Research interests: Computational fluid dynamics; turbulent combustion; soot formation; numerical methods; uncertainty quantification

**Xiang Yang**

Ph.D., Johns Hopkins University, 2016
 Assistant Professor of Mechanical Engineering
 338C Reber / 814-867-0382 / xzy48@psu.edu
Research interests: Turbulence; wall-bounded turbulence; turbulence modeling; computational fluid dynamics; data-based modeling

**Richard A. Yetter**

Ph.D., Princeton University, 1985
 Professor of Mechanical Engineering
 111 Research East / 814-863-6375 / ray8@psu.edu
Research interests: Combustion/environmental science; combustion chemistry; heterogeneous combustion; materials synthesis; propellant combustion; combustion generated pollutants; atmospheric plume chemistry; chemical processing

