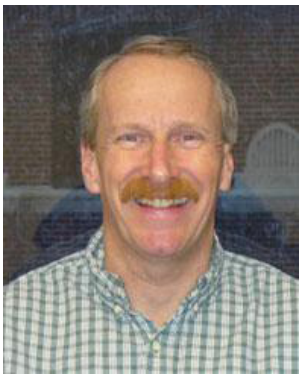
MSE FACULTY AT A GLANCE

DAVID BAHR, HEAD AND PROFESSOR OF MATERIALS ENGINEERING

dfbahr@purdue.edu



JOHN BLENDELL, PROFESSOR OF MATERIALS ENGINEERING

Design of Microstructure for Optimal Properties, Grain Growth in Anisotropic Systems, Reliability of Electronic Interconnects, Stress Relaxation in Thin Films, Ferroelectric Thin Films and Bulk Materials

blendell@purdue.edu

MUKERREM CAKMAK, REILLY PROFESSOR OF MATERIALS ENGINEERING

Roll to roll manufacturing of multifunctional films for sensors and flexible electronics. Modeling and experimental studies on processing; structure property relationships in polymer fibers, films and moldings and polymer/metal/ceramic hybrid systems.

cakmak@purdue.edu | More on Roll-to-Roll Manufacturing

NIKHILESH CHAWLA, RANSBURG PROFESSOR OF MATERIALS ENGINEERING

Four-Dimensional (4D) materials science with a particular emphasis on the deformation behavior of advanced materials at bulk and small length scales. Prof. Chawla works on cutting-edge problems by examining the structure and properties of materials using in situ x-ray microtomography, correlative microscopy, image analysis, and nanoindentation.

nikc@purdue.edu

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

WEINONG CHEN, REILLY PROFESSOR OF AERONAUTICS AND ASTRONAUTICS & MATERIALS ENGINEERING; ASSOCIATE DEAN FOR RESEARCH AND INNOVATION; PROFESSOR OF MECHANICAL ENGINEERING

Mechanical Response of Advanced Materials under Extreme Conditions, Microstructural Effects on Mechanical Behavior, Fatigue Behavior of Engineering Materials, Experimental Solid and Structural Mechanics

wchen@purdue.edu

CHELSEA DAVIS, ASSISTANT PROFESSOR OF MATERIALS ENGINEERING

Molecular visualization of interfacial mechanics. Adhesion, friction, and wetting mechanisms are critical surface phenomena that must be addressed and understood to enable innovations in polymer surfaces and coatings technologies. Utilizing custom-built mechanical testing devices in situ with optical microscopy, she is developing new insights into polymer interfacial properties and mechanics

chelsea@purdue.edu | Research Website

ANTER EL-AZAB, PROFESSOR OF MATERIALS ENGINEERING, PROFESSOR OF NUCLEAR ENGINEERING (BY COURTESY)

Dislocation dynamics, Mesoscale plasticity, Microstructure, Phase field methods, Radiation effects in materials, Defect disorder in oxides, Phonon and electron thermal transport, Computational methods in Materials Science

aelazab@purdue.edu

KENDRA ERK, ASSOCIATE PROFESSOR OF MATERIALS ENGINEERING

Structure-property relationships of soft materials and complex fluids – hydrogels, polymer and surfactant solutions, biomass, soft suspensions. Mechanical and rheological characterization. Special interests in developing polymeric additives for concrete.

erk@purdue.edu | Research Website

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

R. EDWIN GARCÍA, PROFESSOR OF MATERIALS ENGINEERING

Microstructural Modeling of Multifunctional Materials, Microstructural Evolution, Reliability and Optimization of FeRAMs, Portable Power Sources (Rechargeable Batteries, Fuel Cells)

redwing@purdue.edu | Research Website

CAROL HANDWERKER, REINHARDT SCHUHMANN JR. ROFESSOR OF MATERIALS ENGINEERING

Next-generation electronic packaging, Pb-free solder interconnects for high performance, military, and aerospace systems, Thermodynamics and kinetics of moving interfaces in sintering, grain growth, and transient liquid phase bonding, Sustainable design of new materials, processes, and supply chains.

handwerker@purdue.edu

JOHN HOWARTER, ASSOCIATE PROFESSOR OF MATERIALS ENGINEERING, ENVIRONMENTAL AND ECOLOGICAL ENGINEERING

howarter@purdue.edu

DAVID JOHNSON, ASSOCIATE PROFESSOR OF MATERIALS ENGINEERING

Development and processing of high temperature structural materials, including the development of specialized solidification processing techniques, Microstructural development in solidification and homogenization through modeling and experiment has been a recent focus. Other work examines the development of new light metal alloys, understanding defect formation during solidification, and aluminum extrusion.

davidjoh@purdue.edu

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

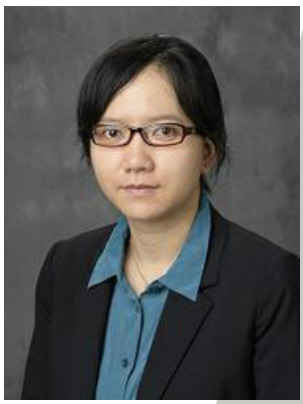
MATTHEW JOHN M. KRANE, PROFESSOR OF MATERIALS ENGINEERING AND OF MECHANICAL ENGINEERING (BY COURTESY)

Design, development and modeling of heat transfer, fluid mechanics and microstructural development in materials processing, especially solidification processes and heat treatment of metal alloys, Through-process modeling of metal production, from casting through heat treat to deformation. Exergy analysis of extractive metallurgy operations. Uncertainty quantification in process modeling.

krane@purdue.edu | More on Research Interests

ERIC KVAM, PROFESSOR OF MATERIALS ENGINEERING

kvam@purdue.edu | More on Research Interests



PEILIN LIAO, ASSISTANT PROFESSOR OF MATERIALS ENGINEERING

Applying first-principles computational methods to study materials for renewable energy research and catalysis

lpl@purdue.edu | Research Website

MICHAEL MANFRA, PROFESSOR OF MATERIALS ENGINEERING AND ELECTRICAL AND COMPUTER ENGINEERING, BILL AND DEE O'BRIEN CHAIR PROFESSOR OF PHYSICS AND ASTRONOMY

mmanfra@purdue.edu | Research Website

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

JAN-ANDERS MANSSON, DISTINGUISHED PROFESSOR OF MATERIALS ENGINEERING AND CHEMICAL ENGINEERING, AND CO-DIRECTOR OF IN-MAC

Research interests are primarily in Composite manufacturing, covering topics such as: Processes & Materials for "High-Volume" Composites, Hybrid Molding for Complex Shape Molding, Functional Material-Forms, Technical Cost Modeling & Implementation Strategies

jmansson@purdue.edu | More on Research Interests

ERNESTO MARINERO, PROFESSOR OF MATERIALS ENGINEERING

The Marinero research group focuses on the manipulation of atomic order and microstructure of nano materials for device applications in energy conversion & storage, spin-based nanoelectronics and for biomedical applications. An overarching goal of this research is the translation of its outcomes into technological applications.

eemarinero@purdue.edu | Research Website

CARLOS MARTINEZ, PROFESSOR OF MATERIALS ENGINEERING

cjmartinez@purdue.edu

PAUL MORT, PROFESSOR OF MATERIALS ENGINEERING

pmort@purdue.edu

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

MARIA OKUNIEWSKI, ASSISTANT PROFESSOR OF MATERIALS ENGINEERING AND NUCLEAR ENGINEERING

Dr. Okuniewski's research focus on understanding the connections between the microstructure of nuclear materials and fuels and their mechanical properties. The microstructural evolution is studied as a function of radiation damage and/or fabrication and processing of the nuclear systems. This research aims to connect phenomena that span multiple spatial and temporal scales.

mokuniew@purdue.edu

DAVIN PIERCEY, ASSISTANT PROFESSOR MATERIALS ENGINEERING AND MECHANICAL ENGINEERING

TSynthesis of high-nitrogen compounds. Energetic Materials. Propellants, explosives, and pyrotechnics. Small-scale energetic material characterization. Heterocyclic compounds.

dpiercey@purdue.edu | Research Website

R. BYRON PIPES, JOHN L. BRAY DISTINGUISHED PROFESSOR OF ENGINEERING

Dr. Pipes' graduate students work in composites manufacturing simulation focuses on the influence of manufacturing processes on the development of composites microstructure and the resulting implications upon structural performance. Two primary manufacturing processes are the subject of the majority of the scholarship underway and these include composites additive manufacturing (cAM) through fused filament fabrication and discontinuous prepreg platelet composites.

bpipes@purdue.edu

RAHIM RAHIMI, ASSISTANT PROFESSOR OF MATERIALS ENGINEERING

Flexible and stretchable electronics and sensors, Wearable and implantable healthcare devices, Biomaterials and drug delivery systems, Lab-on-a-chip platforms for tissue engineering and rapid diagnostics, Printed electronics, Laser processing, Functional polymer composites, Smart functional fibers and textiles.
rrahimi@purdue.edu | Research Website

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

SHRIRAM RAMANATHAN, PROFESSOR OF MATERIALS ENGINEERING

Professor Ramanathan investigates structure-property relations in complex oxide thin films and exploratory solid state devices for information processing and energy conversion. Their group is closely involved in synthesis of metal-oxide thin films with atomic scale control over structure and composition and understanding ionic and electronic transport in strong electric fields. They are particularly interested in oxides where Coulomb interactions lead to new phases that allow unprecedented properties to emerge. Another area of long standing interest is solid oxide fuel cells utilizing ultra-thin suspended oxide membranes.

shriram@purdue.edu | Research Website

KENNETH SANDHAGE, REILLY PROFESSOR OF MATERIALS ENGINEERING

Development of novel shape-preserving reaction processes and conformal coating methods (biogenic or synthetic) for generating ceramic, metallic, and composite materials with tailored chemistries and macro-to-nanoscale structures for energy, environmental, aerospace, defense, and medical applications (e.g., heat exchangers for concentrated solar power; battery anodes; arsenic removal from water; sensors; components for jet engines, rocket nozzles, or hypersonic structures; 3-D printed biomedical implants).

sandhage@purdue.edu | More on Research Interests

ELLIOTT SLAMOVICH, PROFESSOR OF MATERIALS ENGINEERING

Low temperature processing routes to ceramic powders, thin films, and polymer/ceramic composites and ceramics processing.

elliotts@purdue.edu | More on Research Interests

ROBERT SPITZER, ASSOCIATE PROFESSOR OF MATERIALS ENGINEERING

Thermodynamics, Rate phenomena, Electrochemistry, Corrosion, Chemical metallurgy, Computer simulation of metallurgical processes

rhs@purdue.edu

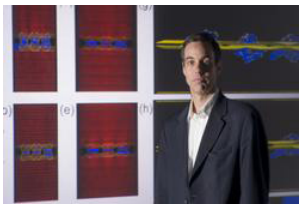
PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

LIA STANCIU, ASSOCIATE HEAD AND PROFESSOR OF MATERIALS ENGINEERING

Electrochemical materials, biointerfaces, chemical and biological sensing, and large scale manufacturing of flexible electronics.

lstanciu@purdue.edu | Research Website



ALEJANDRO STRACHAN, PROFESSOR OF MATERIALS ENGINEERING

Electronic, thermal and mechanical properties of nano- and micro-electromechanical systems and electronic and energy conversion devices; thermo-mechanical response of polymer composites and molecular solids; and physics and chemistry of active materials including shape memory and energetic materials.

strachan@purdue.edu | Research Website

MICHAEL TITUS, ASSISTANT PROFESSOR OF MATERIALS ENGINEERING

Rapid discovery and development of high temperature structural materials, Solute interactions with crystalline defects, Thermodynamic modeling and experimental validation of high temperature oxidation.

titus9@purdue.edu | Research Website

RODNEY TRICE, PROFESSOR OF MATERIALS ENGINEERING

Injection molding of ceramics (zirconium diboride, boron carbide, silicon nitride, alumina); 3D printing of ceramics, ceramic matrix composites, and carbon-carbon composites; high emissivity coatings and window materials for hypersonic flight; thermal barrier coatings; suspension plasma spray; hot corrosion and biofuel corrosion of gas turbine ceramics; armor materials; high-temperature heat exchanger fabrication; ablation testing and high-temperature mechanical testing.

rtrice@purdue.edu | Research Website

PURDUE UNIVERSITY | School of Materials Engineering

MSE FACULTY AT A GLANCE

KEVIN TRUMBLE, PROFESSOR OF MATERIALS ENGINEERING

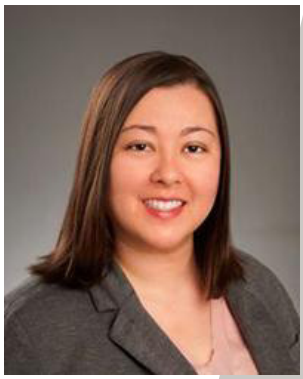
Microstructure development in materials processing: Metal casting and infiltration processing of composites; Machining processes for studying large-strain plastic deformation and sheet metal production; Powder metallurgy and ceramics processing; Mechanical properties.

trumble@purdue.edu

HAIYAN WANG, BASIL S. TURNER PROFESSOR OF MATERIALS ENGINEERING

Design and processing of functional nanocomposite thin films for microelectronics, optoelectronics, high-temperature superconductors, solid oxide fuel cells, plasmonics and photonics, ferroelectric and ferromagnetic applications, and radiation tolerance materials.

hwang00@purdue.edu | Research Website



JANELLE WHARRY, ASSOCIATE PROFESSOR OF MATERIALS ENGINEERING

Microstructures of materials, especially of irradiated and nuclear materials, and the micro/mechanical implications of those microstructures.

jwharry@purdue.edu | Research Website

JEFFREY YOUNGBLOOD, PROFESSOR OF MATERIALS ENGINEERING

Polymer chemistry, processing and properties; Sustainable materials; Ceramics processing using polymeric methods (injection molding, etc); Polymer coatings and additives, Nanocomposites, 3D printing of ceramics and concrete; Infrastructure materials.

jpyoungb@purdue.edu | More on Research Interests

PURDUE UNIVERSITY | School of Materials Engineering

XINGHANG ZHANG, PROFESSOR OF MATERIALS ENGINEERING

Synthesis of nanomaterials, Radiation Damage in nanostructured materials, Mechanical behavior of nanostructured metals, Functional materials.

xzhang98@purdue.edu | Research Website