



Profiles of Assistant Professors in Mechanical Engineering at Texas A&M University



Dr. Aaron Ames

Assistant Professor, Mechanical Engineering, 2008 – present
Ph.D., Electrical Engineering, University of California at Berkeley, CA, 2006

Research interests:

Dynamical, control, robotic and hybrid systems, with a special emphasis on bipedal robots, behavior unique to hybrid systems such as Zeno behavior and the mathematical foundations of hybrid systems

Selected current projects:

- Bipedal robotic walking — theory and practical applications
- Completing hybrid system models
- Zeno behavior in hybrid systems



Dr. Raymundo Arrovave

Assistant Professor, Mechanical Engineering, 2006 – present
Ph.D., Massachusetts Institute of Technology, Cambridge, MA, 2004

Research interests:

- Metallic and ceramic alloys
- High temperature materials development
- Interfacial phenomena
- Computational thermodynamics and kinetics of materials
- Ab initio methods
- Alloy theory

Selected current projects:

- Prediction of thermo-mechanical properties of high temperature materials via ab initio methods
- Modeling of interfacial interactions between lead free solders and metallic substrates
- Simulation of thermodynamics, kinetics and microstructural evolution in light metal alloys
- Ab initio simulation, thermodynamic modeling and design of novel shape memory alloys
- Modeling of thermodynamics and kinetics of hydrogen storage in multi-layer nano-films



Dr. Debjyoti Banerjee

Assistant Professor, Mechanical Engineering, 2005 – present
Ph.D., University of California, Los Angeles, CA, 1999

Research interests:

- Multi-phase flows and heat transfer
 - Micro/nano-thermocouples, carbon nanotubes, silicon nano-fins
 - Computational fluid dynamics, molecular dynamics, fractals/ chaos
 - Nano-fluids, nano-fluidics, nano-synthesis, nano-manufacturing, materials characterization
 - Solar energy
- Emerging technologies
 - Microfluidics and LOC (lab-on-chip), nano/bio-technologies, DPN (dip pen nanolithography), MEMS (micro electro mechanical systems), nano-sensors for explosives detection

Selected current projects:

- Flow boiling measurements using micro/nano-thermocouples
- Pool boiling measurements on nanofins
- Nanofluids for solar energy applications
- Synthesis of carbon nanotubes with a single chirality using DPN
- Lab-on-chip for health monitoring, water quality monitoring using peptide assay
- Microfluidic synthesis of lipid bilayers, fountain pen nanolithography
- Reconfigurable microfluidic device for realizing photonic bandgap crystals (negative refractive index materials)



Dr. Andrew Duggleby

Assistant Professor, Mechanical Engineering, 2008 – present
Ph.D., Virginia Polytechnic Institute and State University, Blacksburg, VA, 2006

Research interests:

- Turbulent transport of mass, momentum, and heat in fluids and plasmas using high performance computational diagnostics and mathematical analysis
- Turbulent pipe flows (Direct Numerical Simulation)
- Large-Scale Gas turbine engines simulations
- Spatiotemporal chaos (Rayleigh-Benard convection, mixing)
- Multiphysics flows (weld pools, multi-phase)
- Turbulence in fusion plasmas

Selected current projects:

- LES of Gas Turbine Endwall cooling
- Buoyancy driven turbulence control by initial conditions
- Mixing in low Reynolds number flows
- Large-scale structures in turbulent pipe flows



Dr. Jaime Grunlan

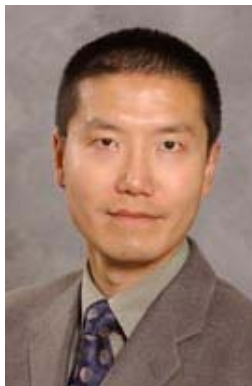
Assistant Professor, Mechanical Engineering, 2004 – present
Ph.D., Materials Science and Engineering, University of
Minnesota, Minneapolis, MN, 2001

Research interests:

- Layer-by-layer assembly of multifunctional polymer and composite thin films; focused on transport behavior (electrical, thermal, and mass)
- Tailoring bulk nanocomposite microstructure with stimuli-responsive polymers
- Segregated network polymer nanocomposites with high conductivity and low filler concentration

Selected current projects:

- Nano brick wall thin films, made by self-assembling polymer and clay, for imparting flame retardancy to foam and oxygen barrier to food and electronics packaging
- Thermoelectric polymer composites for producing energy from waste heat that is generated by a human body, engine friction, exhaust, etc.
- High temperature polyimides and their carbon fiber composites for bodies of aircraft that are expected to exceed Mach 6 speeds
- Controlling carbon nanotube microstructure using pH-responsive and thermo-responsive polymers
- Electrochromic thin films for display applications with fast switching and high contrast ratios



Dr. Bing Guo

Assistant Professor, Mechanical Engineering, 2006 – present
Ph.D., Thermal Engineering, Tsinghua University, Beijing,
China, 1998

Research interests:

- Nanoparticle formation in combustion
- Synthesis of nanomaterials by flame aerosol methods
- Application of nanomaterials in energy and environment
- Safety of engineered nanomaterials
- Aerosol sampling, collection and identification

Selected current projects:

- Magnetic core-shell & Janus functional nanoparticles
- Biological effects of carbon black and Fe₂O₃ nanoparticles
- Gas sensors made of functional nanomaterials
- Bioaerosol sampling and detection
- Computation fluid dynamics (CFD) simulation of aerosol flows



Dr. Timothy Jacobs

Assistant Professor, Mechanical Engineering, 2006 – present
Ph.D., University of Michigan, Ann Arbor, MI, 2005

Research interests:

- IC engine combustion and emission formation fundamentals
- Novel modes of combustion for diesel engines
- Exhaust after treatment systems for diesel engines

Selected current projects:

- Nitric oxide formation in biodiesel combustion
- Performance and system response of diesel engine with biodiesel fuels
- Natural gas homogenous charge compression ignition combustion development
- Diesel low temperature combustion / premixed charge compression ignition combustion development



Dr. Julie Linsey

Assistant Professor, Mechanical Engineering, 2008 – present
Ph.D., University of Texas at Austin, TX, 2007

Research interests:

- Engineering Design Theory and Methods
- Engineering Innovation and Creativity
- Conceptual Design and Design by Analogy
- Design Cognition
- Engineering Education
- Design-by-Analogy

Selected current projects:

- SGER: Collaborative Research: VisualizeIT - Measuring the Impact of IT-Enabled Concept Generation on Designer Creativity, National Science Foundation
- Creating and Teaching a Methodology for Global Multidisciplinary Distributed Design: dDesign
- Physical Representations in Engineering Design
- Idea Generation Methods for Globally Distributed Virtual Teams
- Development of Design-by-Analogy Methods



Dr. Anastasia Muliana

Assistant Professor, Mechanical Engineering, 2004 – present
Ph.D., Structural Engineering and Mechanics, Georgia
Institute of Technology, Atlanta, GA, 2004

Research interests:

- Nonlinear and time-dependent material modeling
- Coupled mechanical and non-mechanical analyses in smart composites
- Micromechanics of composite materials
- Multi-scale material and structural modeling of composites
- Large-scale nonlinear structural analysis
- Numerical and finite element analyses

Selected current projects:

- Time-dependent multi-scale modeling of multi-layered composite materials and structures
- Micromechanical modeling of transient heat conduction in composites
- Modeling deformation in viscoelastic functionally graded materials subject to thermal stimuli
- Modeling coupled thermal, electrical, and mechanical responses in smart composite with application to morphing composite structures
- Creep tests on polymer composite and piezocomposite specimens under various temperatures



Dr. Miladin Radovic

Assistant Professor, Mechanical Engineering, 2006 – present
Ph.D., Drexel University, Philadelphia, PA, 2001

Research interests:

- High temperature materials for energy applications
- Processing of advanced ceramic materials
- Characterization and modeling of mechanical properties of ceramic and metallic materials
- Reliability and durability of ceramic materials and components
- Processing and characterization of materials for fuel cells
- Resonant ultrasound spectroscopy

Selected current projects:

- Thermo-mechanical properties of ionic conductors
- Processing and characterization of geopolymers
- Processing and characterization of MAX phases



Dr. Bryan Rasmussen

Assistant Professor, Mechanical Engineering, 2006 – present
Ph.D., University of Illinois, Urbana-Champaign, IL, 2005

Research interests:

- Dynamic modeling and control of thermo-fluid energy systems (HVAC)
- Modeling and control of alternative energy systems (solar hydrogen, clean coal, bio-mass gasifiers)
- Model reduction, model validation, automated modeling
- Nonlinear control, robust control

Selected current projects:

- Model-based control and diagnostics for CO₂ vapor compression systems
- Reduced order dynamic models of vapor compression systems
- Decentralized Model Predictive Control for HVAC system networks
- Real-time robust model validation and model tuning algorithms
- Educational mechatronic/control projects using Nintendo Wii



Dr. Cris Schwartz

Assistant Professor, Mechanical Engineering, 2006 – present
Ph.D., Iowa State University, Ames, IA, 2006

Research interests:

- Polymers and composites tribology
- Orthopedic devices
- Biomaterials
- Haptics and tactile sensation of materials
- Design and innovation methodology

Selected current projects:

- Development of ultrahigh molecular weight polyethylene composites for industrial and biomedical applications
- Correlation of material tactility with quantifiable mechanical and physical properties for haptic design
- Development of strategies to improve the tribological behavior of polymers and composites
- Design and optimization of polymer-based materials for therapeutic biomedical applications
- Development and assessment of a computational tool for enhanced productivity during conceptual design



Dr. Sy-Bor Wen

Assistant Professor, Mechanical Engineering, 2007 – present
Ph.D., University of California at Berkeley, CA, 2006

Research interests:

- Laser processing with ultrahigh speed pulsed laser
- Chemical analysis with laser induced plasma
- High speed imaging and temperature measurement with pulsed laser
- Nanomaterial generation with laser ablation
- Nanoscale conductive and radiative energy transport

Selected current projects:

- Simulation of nanoparticle generation from high temperature plasma
- Simulation of laser material interaction in submicron range
- Thermal analysis for nano-optical devices
- Generation of multilayer multicomponent nanoparticles with laser ablations
- Direct nanoscale fabrication and detection with nanoscale laser ablation



Dr. Choongho Yu

Assistant Professor, Mechanical Engineering, 2007 – present
Ph.D., University of Texas at Austin, TX, 2004

Research interests:

- Thermoelectric energy conversion
- Photo-thermal and photovoltaic energy conversion
- Thermal managements

Selected current projects:

- Investigation and synthesis of new nanostructured materials including nanowires, nanotubes, nanoparticles, nanostructure embedded composites, polymer nanocomposites, and metal oxides for thermoelectric and photovoltaic energy conversion systems
- Measurements of thermal and electrical transport properties of various nanostructures, thin films, and polymer nanocomposites
- Synthesis and characterization of nanocomposite materials for the thermal management of heat dissipating devices and systems



Dr. Xinghang Zhang

Assistant Professor, Mechanical Engineering, 2005 – present
Ph.D., Materials Science and Engineering, North Carolina State University, Raleigh, NC, 2001

Research interests:

- Radiation tolerant nanostructured materials (multilayers, coatings and bulk materials)
- Mechanical properties of metallic films and multilayers
- Microstructure analysis by various microscopy techniques (high-resolution TEM, STEM)
- Thin film stress and strain
- Physical (thermal, electrical and magnetic) properties of films and multilayers
- Phase transformations in nanostructured thin films
- Bulk nanostructured materials by severe plastic deformation

Selected current projects:

- Radiation tolerant nanostructured materials (multilayer films, coatings and bulk materials)
- Mechanical and electrical properties of metallic films with high-density nanoscale growth twins
- Magnetic shape memory alloy thin films
- Bulk nanostructured metals