**OUR DEGREE PROGRAMS**

Having seven top-ranked programs in Mechanical Engineering, Engineering Mechanics, and Theoretical and Applied Mechanics within the same department allows our students to tailor their curricula while providing departmental resources like the unparalleled strengths of our faculty in seven fundamental research areas and six focused societal impact areas (see the matrix, next page).

Our degree programs provide students with choice in how and what they learn:

- BS, M.Eng., MS, and PhD degree programs in Mechanical Engineering (online options for M.Eng. and MS)
- BS degree program in Engineering Mechanics
- MS and PhD degree programs in Theoretical and Applied Mechanics

**UNDERGRADUATE**

MechSE’s undergraduate programs are consistently among the top-ranked Engineering Mechanics and Mechanical Engineering programs in the world as a result of distinguished faculty, excellent undergraduate research opportunities, state-of-the-art facilities, active student societies, a collegial and collaborative environment, and exceptionally bright students from around the world. Our primary goal is to educate our students to become future leaders in engineering, science, technology, and beyond, leading the way toward improving society’s quality of life.

MechSE faculty are internationally renowned for their diverse research and excellence in teaching. Many enthusiastically engage undergraduate students in their world-class research programs.

Our instructional and research laboratories give students hands-on experience and provide exposure to a wide range of areas, including: biomechanics; combustion; controls systems; dynamical systems; fluid dynamics; heat transfer; machine design; manufacturing; materials testing; mechatronics; metrology; micro-nano mechanical systems; and robotics. MechSE’s Innovation Studio makerspace provides students with state-of-the-art prototyping equipment and tools to realize their designs.

The Engineering Mechanics and Mechanical Engineering curricula offer a wide variety of courses, including an integrated hands-on design sequence beginning in the freshman year and culminating in Senior Capstone Design, where students develop a solution to a real-world, company-sponsored problem.

Additionally, with a special pre-med track, our undergraduate students have an option to follow a special program of courses that will help enable them to qualify for medical school.

MechSE students gain the critical thinking skills necessary to solve even the toughest engineering problems. Upon graduation, nearly 100% of our students reporting post-graduation plans were either professionally employed or pursuing graduate school. MechSE students strongly outpace national averages on the national Fundamentals of Engineering (FE) certification exam, with a near-perfect pass rate. mechse.illinois.edu/undergraduate

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### Undergraduate Statistics

- **32.1** average ACT score for incoming undergraduate students
- **27.2** average number of AP credit hours of incoming undergraduate students
- **#5** ranked research-based graduate programs
- **#3** ranked online master’s programs

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**GRADUATE**

Our students thrive throughout their advanced studies in Mechanical Engineering or in Theoretical and Applied Mechanics due to the excellence of our faculty, the diversity and complexity of our research opportunities, and the individualized programs of study we strive to create for each of our students. MechSE graduates go on to top positions in academia, industry, and government labs, and our programs have earned a reputation as some of the best in the world.

Many of MechSE's graduate research opportunities lie at the intersection of diverse areas of specialization. Our scholars are immersed in a multitude of cross-disciplinary research efforts, training our students to be among the most innovative engineers in the world.

Student engagement is another hallmark of MechSE programs. The department fosters a culture that is highly supportive and collegial while offering all the benefits of a large department within a world-renowned institution. Many of our students actively participate in student and professional organizations, including Graduate MechSE Students (GraMS), Engineers Volunteering in Stem Education (ENVISION), the Society of Women Engineers (SWE), the National Society of Black Engineers (NSBE), and the Society of Hispanic Professional Engineers (SHPE). mechse.illinois.edu/graduate

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**All PhD students in good academic standing are guaranteed a tuition waiver for the first five years of their academic program. The majority of MS students also receive tuition waivers. The Master of Engineering program (self-funded) is a thriving coursework and experiential-learning-based program for industry-focused students.**

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**RESEARCH CENTERS**

Our science-based approach brings MechSE researchers into close contact with researchers in other departments, universities, and research institutions. Our faculty are major participants in activities at the department, college, and university level via research centers.

- Air Conditioning and Refrigeration Center (ACRC)
- Center for Networked Intelligent Components and Environments (C-NICE)
- Center for Autonomy
- Center for Dynamics and Control of Engineering Systems (C-DCES)
- Center for Hypersonics and Entry Systems Studies (CHESS)
- Center for Power Optimization of Electro-Thermal Systems (POETS)
- Center for Wearable Intelligent Technologies (WIT)
- Center for Exascale Simulation of Plasma-Coupled Combustion (XPACC)

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**Campus-Level Institutes**

- Beckman Institute for Advanced Science and Technology
- Coordinated Science Laboratory (CSL)
- Carl R. Woese Institute for Genomic Biology
- Frederick Seitz Materials Research Laboratory (MRL)
- National Center for Supercomputing Applications (NCSA)
- Nick Holonyak Micro and Nanotechnology Laboratory (MNTL)
Mechanical engineering has traditionally dealt with objects and systems at macroscopic length scales. As system size has decreased to the nanoscale, the research efforts in the Department of Mechanical Science & Engineering have focused on phenomena at surfaces and length scales that have historically been the domain of physics and chemistry. At the same time, mechanical engineers use a systems approach to create new ideas and products that are far-reaching in order to meet societal needs. Research at MechSE, therefore, is pivotal, creating opportunities at the intersection of science and engineering.

Each area requires substantial collaboration, either among fundamental areas within engineering, or with other disciplines such as chemistry, physics, biology, or medicine. These collaborative efforts have the potential to shorten the timeline from scientific discovery to solutions that address ongoing and ever-changing global concerns.

Our faculty are developing unprecedented capabilities—in experiment and in simulation—that will advance the field for years to come. Our approach is reflected in how we educate our students at all levels and in our next-generation curriculum in mechanical science and engineering.

Read more at mechse.illinois.edu/research.

### 2020-21 Faculty Research at a Glance

To have the greatest impact on the world around us, MechSE faculty have aligned their research efforts with societal needs. The seven columns of our faculty research matrix list the fundamental areas of the discipline, while the six rows represent critical societal needs.

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agricultural, petroleum, and biomedical engineering. Developed a new approach for design of robust adaptive control systems with guaranteed robustness/performance, pioneered a new approach to safe learning within the robust adaptive control architecture, explored safety systems from the perspective of humans’ perceived safety, and contributed to the foundation for development of cyber-secure autopilots.

Predrag (Pega) Hrnjak: Stoecker Fellow Faculty, Distinguished Research Professor, and Director of ACRC / D.Sc., University of Belgrade, 1992. Current research: Heat transfer and fluid mechanics with end-use energy conversion applications as refrigeration, heat pumps, and air conditioning. Adiabatic two phase flow distribution in parallel flow heat exchangers including flash gas removal and articulation of pulsating flow; nonequilibrium condensation in presence of superheated vapor; periodic frosting in microchannel heat exchanges; visualization of oil-refrigerant flows in compressors and pipes; developing two phase flow, environmentally sound cycles;player a role in heat exchanger research. Developed extremely low charged ammonia systems with microchannel heat exchangers; new synthetic refrigerants; novel heat exchanges.

Elizabeth T. Hsiao-Weckler: Professor and Willett Faculty Scholar / PhD, University of California, Berkeley, 2000. Current research: Musculoskeletal biomechanics of locomotion; assistive device design; powered exoskeletons; medical training simulators; wearable sensors for movement analysis; advanced mobility devices. Developed methods to better quantify gait and postural control; created portable powered ankle-foot-orthosis, automatic gear shifting manual wheelchair, and robotic simulator for performing the neurological examination.

Shelby Hutchins: Assistant Professor / PhD, California Institute of Technology, 2011. Current research: Failure in soft solids: soft solid dynamics; large, non-linear deformation mechanics; polymers and composites; microscale materials; cellular solids. Discovered a critical length scale in the cut-driven failure of solidotomic solids. Constructed soft, osmotically-active, plant tissue-inspired liquid/solid composites.

Anthony Jacoby: Richard W. Kritzer Distinguished Professor and Department Head / PhD, Purdue University, 1989. Current research: Heat transfer and fluid mechanics with end-use energy applications. Advanced vortex-enhanced and interrupted fin designs to improve heat transfer and reduce pressure drop; developed surface microstructures for condensate management.

Iwona Jasiuk: Professor / PhD, Northwestern University, 1986. Current research: Mechanics of materials; micromechanics; biomechanics; composite, biological, and nano materials; interfaces; elasticity. Characterized hierarchical structure, composition, and properties of bone and developed experimentally based multi-scale models of bone. Proposed new porous lattice model of bone adaptation based on energy dissipation. Designed, additively manufactured, and modelled novel lightweight multifunctional bioinspired architectural materials.

Blake Johnson: Teaching Assistant Professor and Director of Undergraduate Instruction Laboratories / PhD, University of Illinois at Urbana-Champaign, 2012. Experimental fluid mechanics; optical diagnostics; pedagogy.

Harley Johnson: Professor, Kritzer Faculty Scholar, and Associate Dean for Research / PhD, Brown University, 1999. Current research: Nanomechanics of electronic and phononic materials; mechanisms of nanostructures; materials for photovoltaics; defects and properties of 2D materials; plasma-material interactions. Described a new class of dislocations in layered 2D materials.

Gabriel Juarez: Assistant Professor / PhD, Northwestern University, 2009. Current research: Physics of fluids and living systems, biodegradation of crude oil by bacteria, hydromechanics of coral larvae on reefs. Developed microfluidic devices and flow visualization techniques to quantify microscale processes in heterogeneous fluid environments such as bacterial growth on oil-water interfaces and larva settlement on surfaces.

Shiv Kapoor: Professor and Gracey Wicall Gauthier Chair / PhD, University of Wisconsin-Madison, 1977. Current research: Micro-manufacturing; micromachining process modeling; micro-Machine Tools (mMTs) and microfactories for manufacturing precision parts; characteristically and architected; sustainable manufacturing. Developed micro-machining technology based on the use of mMTs and integration of mMTs into microfactories for manufacturing precision parts.

Marina Kersh: Assistant Professor / PhD, University of Wisconsin-Madison, 2010. Current research: Structure-function in musculoskeletal tissues during growth and aging; imaging; finite element method. Quantified bone strain in vivo, during locomotive tasks using coupled multi-scale musculoskeletal and finite element model.

Seok Kim: Associate Professor / PhD, Carnegie Mellon University, 2009. Current research: Responsive surfaces with tunable functionality in self-defending microfluidics, micromachining prototypes (MEMS), dissipative shock absorbers, memory polymer dry adhesives; established LEGO-like microassembly processes for heterogeneous materials integration; developed MEMS vibration energy harvesters.


Seid Koris: Research Associate Professor / PhD, University of Illinois at Urbana-Champaign, 2006. Current research: Large-scale multiphysics modeling; high-performance computing; materials processing; biomechanics; sparse direct solver technologies, confluence of numerical modeling and artificial intelligence (AI). Developed, implemented, and tested several ground-breaking numerical methods for solving highly nonlinear multiphysics and multiphase problems on NCSA’s peta-scale high-performance computing system of Blue Waters and created an effective approach toward accurate modeling of many manufacturing, materials processing, and biomechanics processes.

Herman Krier: Research Professor and Professor Emeritus / PhD, Princeton University, 1968. Reactive dynamics; internal ballistics of rockets and guns; combustion physics; plasma dynamics.

Peter Kurath: Research Professor and Professor Emeritus / PhD, University of Illinois at Urbana-Champaign, 1984. Fatigue, fracture, plasticity and nonlinear deformation modeling; veterinary biomechanics; structural design.

Chia-Fon Lee: Professor / PhD, Princeton University, 1995. Current research: Modeling of two-phase turbulent reacting flows; internal combustion engines; liquid atomization; spray systems. Developed and demonstrated the first successful application of two-photon nitric oxide laser-induced fluorescence measurements in a diesel engine.

Tonghun Lee: Professor and Kritzer Faculty Scholar / PhD, Stanford University, 2006. Current research: Hypersonic and gas turbine propulsion; combustion; laser propulsion; alternative power generation. Investigated novel chemical energy conversion phenomena in combustion systems using advanced laser diagnostics.

Leon Liebenberg: Teaching Associate Professor / PhD, University of Johannesburg, South Africa, 2003. Current research: Pedagogies of engagement and emotional learning strategies; energy, materials and the environment; human-centered design. Created a non-contact cancer detection procedure for women. Developed microtechnological methods. Co-developed a novel engineering course based on the precepts of whole-mind thinking and interdisciplinary teams. Co-founded the TechnoLab technology awareness facility in South Africa, which employs learning-through-play at schools.

Moshe Matalon: Grainger College of Engineering Distinguished Professor / PhD, Cornell University, 1977. Current research: Combustion theory; modeling and simulation of chemically reacting flows; theoretical fluid mechanics; applied mathematics; stability and bifurcation theory; asymptotic and perturbation methods. Developed (i) the hydrodynamic theory of flame propagation in premixed combustible gases including the well-known flame speed-flame stretch relation and a coordinate-free expression for the flame stretch rate, (ii) criteria for the onset of instabilities in premixed combustion, (iii) theory for premixed turbulent flames for ad-hoc turbulence modeling, (iv) a multi-dimensional, time-dependent theory of diffusion flames valid throughout the complete range—from complete burning to extinction, (v) first characterization of thermo-diffusive instabilities in diffusion flames (cellular and pulsating), (vi) new contributions to droplet, solid particle combustion, edge flame dynamics, micro-scale combustion and in porous media, and flame acceleration in long narrow channels.

Katie Matlack: Assistant Professor / PhD, Georgia Institute of Technology, 2014. Current research: Wave propagation in complex media; architectural and phononic materials; additive manufacturing; nonlinear ultrasound. Developed 3D-printed metamaterials for broadband and low frequency vibration absorption; showed the feasibility of using nonlinear ultrasonic techniques to monitor irradiation damage in nuclear reactor pressure vessel steels.

Prashant Mehta: Professor / PhD, Cornell University, 2004. Current research: Dynamical systems; control theory; nonlinear estimation. Invented the feedback particle filter algorithm for nonlinear estimation.

Glennys Mensing: MMMs Lab Coordinator and Lecturer / PhD, Vanderbilt University, 1999. Microfluidics and microfabrication.

Brian Mercer: Lecturer / PhD, University of California, Berkeley, 2016. Computational and theoretical solid mechanics; molecular dynamics methods; multiscale simulation.

Nenad Miljkovic: Associate Professor and Kritzer Faculty Scholar / PhD, Massachusetts Institute of Technology, 2013. Current research: Phase change heat transfer (boiling, evaporation, condensation, and freezing); anti-fouling coatings, anti-corrosion coatings, anti-bacterial coatings, fluid mechanics of droplets and bubbles; micro/nano-fluidic interfacing; micro-machining; microfluidics; energy conversion. Developed guidelines for the design, optimization, and fabrication of micro/nano-structured surfaces to enhance phase change heat transfer.

SungWoo Nam: Associate Professor and Andersen Faculty Scholar / PhD, Harvard University, 2011. Current research: Nanoscale materials; graphene and two-dimensional materials; strain engineering; flexible electronics; bioelectronic interfaces. Published several contributed chapters or reviews on (i) of exceptionally thin, two-dimensional (2D) materials. Developed mechanical self-assembly of folded and crumpled graphene and two-dimensional materials for strain-tolerant and flexible/stretchable forms of sensors for biotic and abiotic investigations.

Martin Ostoj-Chwarszewski: Professor / PhD, McGill University, 1983. Current research: Mechanics and transport in random and fractal media; helices and chiral media; non-classical thermomechanics; stochastic wave propagation; traumatic brain injury; phase transitions. Investigated (i) models of impact waves in man-made and natural media, including human brains under concussion; (ii) micromechanically based scaling laws, random fields, and stochastic finite elements; (iii) universal elastic anisotropy index; (iv) modification of continuum mechanics accounting for spontaneous nanoscale variations of the engineering stress-strain characteristics; (v) nanoscale mechanics of helically-wound cables; (vi) electromagnetic shielding by nanocomposites.
**Arne Pearlstein**: Professor / PhD, University of California, Los Angeles, 1983. 
**Current research**: Computational studies of incompressible flow, with applications to stability; vortex shedding; contaminant removal, and chemically reacting systems; experimental development of transparent, invincible, reflective index-matched systems for use as surrogates in multiphase flow. Discovered the first, and most of the known, multi-valued stability boundaries in fluid mechanics.

**James Phillips**: Professor Emeritus / PhD, Brown University, 1969. Current research: Structural testing. Developed a load cell for measuring simultaneously the axial force and twisting moment in wire ropes.

**Michael Philpot**: Lecturer and Associate Professor Emeritus / PhD, Certified Institute of Technology, 1987. Feature-based cost analysis; micro-miniature systems design for manufacture and assembly; rapid prototyping and layered manufacturing.

**João Ramos**: Assistant Professor / PhD, Massachusetts Institute of Technology, 2018. 
**Current research**: Whole-body teleoperation of humanoid robots, control and optimization for dynamic motions; human-machine interfaces; bio-inspired robotics. Developed a bilateral feedback teleoperation strategy to synchronize the motion of a human operator and that of a humanoid robot for dynamic manipulation and agile locomotion.

**M. Taher Saif**: Edward William and Jane Gutsell Professor and Associate Head for Graduate Programs / PhD, Cornell University, 1993. 
**Current research**: Mechanics of microelectromechanical systems (MEMS); nanoscale materials behavior; neuro-mechanics; mechanics of cancer cells and tumor microenvironment; biological machines; single cell mechanics. Discovered a new phenomenon where plastically deformed nano crystalline metals recover up to 80 percent of the plastic strain using macroscopically stress-free conditions; neurons in embryonic fruit flies actively maintain a rest tension, which is essential for neurotransmission.

**Sriniyasa Salapaka**: Professor / PhD, University of California, Santa Barbara, 2002. 
**Current research**: Robust control, scanning probe microscopy, precision positioning systems, combinatorial optimization, machine learning algorithms, and control of power electronics and systems. Developing new control architectures for bottom-up power grids.

**Huseyn Sehitoglu**: Professor and John, Alice, and Sarah Nyquist Endowed Chair / PhD, University of Illinois at Urbana-Champaign, 1983. 
**Current research**: Thermomechanical behavior of materials; phase transformations and shape memory. Developed a model for determining the crystal orientation dependence of critical resolved shear stress for slip in shape memory alloys; developed an atomistic-continuum treatment to predict threshold stress intensity in fatigue in agreement with experiments.

**Chenhui Shao**: Assistant Professor / PhD, University of Michigan, 2016. 
**Current research**: Smart manufacturing; machine learning; statistics; big data analytics in manufacturing; materials joining; manufacturing systems control and automation. Developed spatiotemporal modeling approaches for manufacturing process control. Developed and implemented an integrated monitoring and control system for ultrasonic metal welding.

**Sanjiv Sinha**: Associate Professor and Associate Head for Undergraduate Programs / PhD, Stanford University, 2005. 
**Current research**: Thermoelectric energy conversion physics, materials design and development; advanced heat exchangers; additively manufactured heat transfer devices; electronics cooling technologies; fundamental heat conduction physics; intracellular thermometry. Developing metal-polymer heat exchangers for waste heat harvesting in a roll-to-roll process. Developed thermometer for measuring temperature inside living cells.

**Kyle C. Smith**: Assistant Professor / PhD, Purdue University, 2012. 
**Current research**: Electrochemical separations and energy storage; multi-scale computational modeling; mass, charge, heat, and fluid transport in heterogeneous and porous materials; thermodynamics of electrochemical materials. Developed and predicted strategies to desalinate water in porous electrodes using battery materials. Developing ion sorption materials with molecular recognition guided by atomistic and pore-scale modeling.

**Darrell Socie**: Lecturer and Professor Emeritus / PhD, University of Illinois at Urbana-Champaign, 1977. Fatigue of metallic machine components and structures.

**Petros Sofonis**: James W. Bayne Professor and Associate Head for Graduate Programs and Research / PhD, University of Illinois at Urbana-Champaign, 1987. 
**Current research**: Solid mechanics; elastic-plastic fracture mechanics; materials compatibility with hydrogen; mechanics of next generation nuclear reactor materials; finite element methods. Rationalized and linked for the first time the effects of hydrogen at the microscale with evidence of hydrogen-induced flow localization at the macroscale.

**Kelly Stephani**: Assistant Professor and Kritzer Faculty Fellow / PhD, University of Texas at Austin, 2012. 
**Current research**: Computational modeling of non-equilibrium flows; gas/surface interactions; characterization of material defects/properties. Established the mapping between gas-phase chemical kinetics, surface energetics, and material degradation for high-temperature materials subject to oxidation. Received a 2019 Presidential Early Career Award for Scientists and Engineers (PECASE).

**D. Scott Stewart**: Research Professor and Shao Lee Soo Professor Emeritus / PhD, Cornell University, 1981. 
**Current research**: Multisphere, multicomponent theory and advanced simulation applied to complex high energy density materials.

**Sameh Tawfiq**: Associate Professor / PhD, University of Michigan, 2012. 
**Current research**: Material design, processing, and manufacturing; mechanics of materials. Developed synthesis and self-assembly processes to manufacture multi-functional nanocomposites.

**Brian Thomas**: Research Professor and C. J. Gauthier Professor Emeritus / PhD, University of British Columbia, 1985. 
**Current research**: Metals processing simulation; modeling of continuous casting; steel processing; numerical methods for solidification phenomena.

**Daniel Tortorelli**: George B. Grim Professor Emeritus / PhD, University of Illinois at Urbana-Champaign, 1988. Solid and continuum mechanics; computational mechanics; design optimization. Applying these methodologies to design impact-resistant armor, design thermoelastic composite materials with novel properties, identify defects and crack initiation sites in solid bodies, generate representative river models for oil exploration, and design light weight structures that are readily cast.

**Charles Tucker III**: Research Professor and Alexander D. Rankin Professor Emeritus / PhD, Massachusetts Institute of Technology, 1978. 
**Current research**: Polymers and composite materials; quantitative modeling of processing/microstructure/property relationships; numerical methods. Developed a model for flow-induced fiber orientation that is used in all major injection-molding software packages.

**Alexander Yakakis**: Donald Biggar Willett Professor / PhD, California Institute of Technology, 1990. 
**Current research**: Nonlinear dynamics and vibrations; non-smooth mechanics; linear and nonlinear model updating; granular acoustic metamaterials, nonreciprocal acoustics and stress wave tailoring; targeted energy transfer and vibration energy harvesting; nano- and micro-resonators; passive control of vortex-induced vibrations; micro- and meso-scale resonant mechanisms in design. Working on a new concept for intentional use of strong nonlinearity in design and nonlinear passive energy management; formulated novel nonparametric multi-scale system identification methodologies.

**Arend van der Zande**: Assistant Professor / PhD, Cornell University, 2011. 
**Current research**: Nanomechanics, and functional devices from nanoscale materials and heterostructures; nanoelectromechanical systems (NEMS); atomically precise nanomanufacturing techniques. Developed graphene-based NEMS. First observed atomic grain boundary structure and properties in 2D molecular membranes. Developed techniques for building functional electronic and photonic devices from 2D material heterostructures.

**Pratat Vanka**: Research Professor and Professor Emeritus / PhD, Imperial College, London, 1975. Computational fluid dynamics; multigrid methods; large eddy simulations of turbulence, large eddy simulation algorithms for Navier-Stokes equations (Vanka Smoother); applied CFD for a large number of diverse applications in single and multiphase flows, using parallel computers and GPUs; earned Freeman Scholar Award from ASME, and WJRA Professorship from India.

**Amy Waggoner Johnson**: Professor and Andersen Faculty Scholar / PhD, Brown University, 2002. 
**Current research**: Design, manufacture, characterization, and mechanics behavior of materials for both replacement and repair; cell-material interactions; characterization of soft tissue for applications to preterm birth. Demonstrated bone formation in micron-sized pores and that microporosity and an osteoinductive growth factor (BMP-s) have different, but complementary, roles in bone regeneration in CoP scaffolds with multi-scale porosity.

**Ning Wang**: Leonard C. and Mary Lou Hoelt Professor / PhD, Harvard University, 1990. 
**Current research**: Cytoskeletal biomechanics; cellular mechanobiology; mechanotransduction; stem cell and cancer cell mechanics and biology; mechanobiomechanics; bio-imaging of cytoskeletal structures and stress distribution in living cells. Developed intracellular stress tomography technology and used it to address fundamental questions about stress distribution and mechanotransduction in living cells.

**Sophie Wang**: Research Assistant Professor / PhD, Xi’an Jiaotong University, 2012. 
**Current research**: Thermomechanics, heat transfer, and fluid mechanics. Fundamentals of single-phase and two-phase convection, phase change and stability with applications in energy systems. Heat transfer enhancement, coefficient of performance (COP) improvement, optimization, and control for heating and cooling systems.

**Matthew West**: Associate Professor / PhD, California Institute of Technology, 2004. 
**Current research**: Computational methods; multiscale time integration. Developed the theory of variational time integration methods; obtained fully asynchronous integrators for computational mechanics.

**Aylin Wissa**: Assistant Professor / PhD, University of Maryland, 2014. 
**Current research**: Structural dynamics and control, bio-inspired design of multi-functional systems and mechanisms for mechanical and aerospace systems, experimental evaluation and flight testing of unmanned air vehicles. Developed passive and active wing morphing systems to improve the performance of flapping and fixed wing unmanned air vehicles.