



## RESEARCH FOCUS AREAS



Bioengineering  
and Biotechnology



Catalysis, Surface Science  
and Reaction Engineering



Materials, Polymers  
and Transport Processes



Theory, Data Science  
and Systems

## FACULTY

**Styliani Avraamidou**

Circular economy systems; energy systems; multi-level optimization; robust optimization; supply-chain optimization

**Rose K. Cersonsky**

Molecular modeling and simulation; applied mathematics and machine learning; self-assembly and interactions of complex building blocks; colloids, soft matter, and nanomaterials

**Quentin Dudley**

Plant synthetic biology; metabolic engineering; cell-free systems; genome editing

**Matthew A. Gebbie**

Interfaces; electrochemistry; soft materials; nanoscience; electrocatalysis; energy storage; electrolytes; ionic liquids

**Michael D. Graham**

Fluid mechanics; flow and rheology of complex and multiphase fluids; blood flow; nonlinear dynamics

**George W. Huber**

Heterogeneous catalysis; renewable fuels and chemicals; biomass conversion; plastic recycling

**Daniel J. Klingenberg**

Colloid science; complex fluids; suspension rheology

**Siddarth H. Krishna**

Heterogeneous catalysis; kinetics and mechanisms; microporous materials; sustainable fuels and chemicals; pollution control

**Whitney S. Loo**

Polymers; soft materials; nanomaterials; sustainability

**David M. Lynn**

Soft materials; surfaces and interfaces; polymers; nanotechnology; biotechnology; drug delivery

**Manos Mavrikakis**

Thermodynamics; kinetics and catalysis; surface science; computational chemistry; fuel cells; sensors; nanoscience

**Mai Ngo**

Tissue engineering, cell engineering, mammalian synthetic biology, biomaterials, cell-cell communication

**Sean P. Palecek**

Stem cell engineering; therapeutic cell biomanufacturing; antimicrobial agents; cell signaling

**Brian F. Pflieger (Chair)**

Synthetic biology; biotechnology; protein engineering; sustainable chemical production

**Thatcher W. Root**

Green chemistry; renewable resources; catalysis; spectroscopy

**Marcel Schreier**

Electrocatalysis; renewable energy; electrified interfaces; kinetics and catalysis; surface chemistry; electrochemical synthesis of chemicals

**Eric V. Shusta**

Drug delivery; protein engineering; stem cell engineering; biopharmaceutical design

**Ross E. Swaney**

Process design, synthesis, modeling and optimization

**Reid C. Van Lehn**

Molecular simulations; nanomaterials; soft materials; nano-bio interactions; cell membranes; solvent effects

**John Yin**

Systems biology; virus-cell interactions; immunology; microfluidics

**Victor M. Zavala**

Optimization; control; data science; energy and environmental systems

## AFFILIATE FACULTY

**AJ Boydston**

Additive manufacturing (3D printing); photoredox-catalyzed polymerizations; polymerizations in continuous flow; mechanochemistry

**Padma Gopalan**

Polymer synthesis and characterization; electro-optic and photonic materials; self-assembly of block copolymers; photonic devices; liquid crystalline polymers

**Ive Hermans**

Sustainable chemistry and catalysis engineering

**Vatsan Raman**

Systems and synthetic biology; protein design; biosensors; synthetic bacteriophages; high-throughput functional assays; sequence-function landscapes

**James J. Schauer**

Measurement and chemical characterization tools; air pollution origin and impacts; sensing

**Saverio E. Spagnolie**

Fluid mechanics; soft matter; biophysics; applied mathematics; numerical methods

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