

Topics of Faculty Presentations AY21/22

Department of Chemistry, Missouri University of Science and Technology

For contact information, see <https://chem.mst.edu/people/faculty/> (09/23/21)

Dr. Amitava Choudhury, Associate Professor (presenting in person and via zoom)

- Electrode Materials for Lithium- and Sodium Ion Batteries
- Complex Chalcogenides as Magnetic, Thermoelectric and Super-ionic conductor materials
- Metallo-organic Frameworks for Gas Storage and Catalysis

Dr. Nuran Ercal, MD, PhD, Vitek Chair of Biochemistry (presenting via zoom)

- Role of Thiols in Medicinal Chemistry
- Glutathione and Oxidative Stress-Induced Disorders
- Improving penetration of antioxidant drugs for ocular diseases

Dr. Rainer Glaser, Professor and Chair (presenting via zoom or in person)

- CO₂ Capture from Air: Rubisco-Inspired Oligopeptide Based Reversible Capture Systems and Multilevel Theoretical Approaches to Studies of Enzyme Reaction Mechanism
- Oscillating Chemical Reactions: Video-based Kinetic Analysis and Complete Simulation
- Organic Crystalline Ferroelectric Materials for Nonlinear Optics

Dr. Vadym Mochalin, Associate Professor (presenting in person and via zoom)

- Fundamental Chemistry and Physics of Low-Dimensional Materials and Rational Design of their Applications.
- Computational Modeling of Materials: from Atomistic Scale to Statistical Ensembles.

Dr. Paul Nam, Associate Professor (presenting in person and via zoom)

- Biomass conversion and utilization for sustainable resource and environment
- Supercritical fluids for efficient chemical reaction and separation
- Biomarker for seed quality evaluation or traumatic brain injury diagnosis.
- Biosensor for medical application.
- Biopolymer from bioresources

Dr. Manashi Nath, Associate Professor (presenting via zoom)

- Designing Materials for Efficient Energy Conversion and Storage from Renewable Sources: Story of Transition Metal Chalcogenides
- Crafting Small Materials with BIG Impact: Nanomaterials for Biosensors and *Theranostic* Applications
- Developing non-enzymatic nanobiosensors for continuous health monitoring of patients with diabetes and neurodegenerative disorder.
- Exploring water as a source of clean energy.
- Developing a CO₂ scrubber for cleaning the environment.

Dr. Garry "Smitty" Grubbs II, Associate Professor (presenting via zoom)

- Qualitative and Quantitative Studies of Chiral Species using Fundamental Interactions and Microwave Techniques
- Understanding Bonding at the Bottom of the Periodic Table: f-electron and Relativistic Effect Chemistries

Dr. Prakash Reddy, Professor (presenting via zoom)

- From Superacids to Organofluorine Chemistry

Dr. Thomas Schuman, Professor (presenting via zoom)

- Organic anticorrosion coatings for aluminum and cadmium steel substrates.
- Synthesis of high temperature stable, water-soluble crosslinking monomers.
- Mechanical characterization of hydrated cements.

Dr. Pericles Stavropoulos, Associate Professor (presenting via zoom)

- Building One Bond at a Time: The Case of C–N Bond in Chemistry and Biology
- Beyond Combustion: The Value of the C–H Bond in the Synthesis of Fine Chemicals

Dr. Chariklia Sotiriou-Leventis, Professor (presenting via zoom)

- Aerogels: 3D Nanomaterials-Research Directions and Applications
- Carbon Aerogels for CO₂ Capture

Dr. Jay Switzer, Chancellor's Professor and Curators' Distinguished Professor Emeritus (presenting via zoom)

- Spin Coating Epitaxial Films
- Chiral Surfaces
- Epitaxial Electrodeposition of Transparent Semiconductors
- Flexible Ceramics
- Epitaxial Growth at Ordered Biointerfaces

Dr. Risheng Wang, Associate Professor (presenting via zoom)

- Developing intelligent DNA-based nanomaterials for biomedical and bioanalytical application
- DNA nanotechnology at the interface with material science, plasmonics, and nanofabrication

Dr. Yang Wang, Assistant Professor (presenting in person and via zoom)

- Evaluation the filtration performance of common mask materials
- Air quality sensor data analysis in Twin Cities, Minnesota
- Air quality sensor calibration and deployment in underground mines
- Chemical composition analysis of aerosols generated from electronic cigarettes

Dr. Jeffrey Winiarz, Associate Professor (presenting in person and via zoom)

- Enhanced Response Time in Photorefractive Composites Through Inclusion of Semiconductor Nanocrystals
- Real-Time Holographic Polymers Utilizing Nanocrystal Photosensitization

Dr. Klaus Woelk, Associate Professor (presenting in person and via zoom)

- Optimizing the EXCEPT-12 NMR pulse sequence for solvent-signal suppression in testing alcoholic beverages.
- NMR Relaxometry to Investigate the effectiveness of catalytic methanol production.
- Alternating non-negative least-squares (NNLS) optimization to resolve distributions of multiple exponential decay time constants