MS&E Academic Advisors

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Research Interests

Carbon nanostructures; organic electronics & optoelectronics: photovoltaic solar cells, organic light emitting diodes; materials for alternative energy and energy storage; nanoelectronics.

Solid-solid interface structures, crystal defect microstructures, microstructure in thin films and engineered substrates, applications of electron microscopy in materials research.

X-ray diffraction, microscopy, and optics; x-ray probes for ultrafast dynamics; nanoscale properties of magnetic materials; domains and switching in ferroelectric materials; monolayer scale organic electronics.

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

Materials processing and transport phenomena including: welding, casting, and crystal growth of semiconductors and metals.

Computational materials science for materials design; \textit{ab-initio} electronic structure methods and thermokinetic modeling; applications in nuclear, battery, fuel cell, semiconductor, deep earth, and complex oxide materials.

Mechanical properties, alloys, materials applications and microelectronics, thin films, nanoindentation.
Paul M. Voyles  
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Structure and defects in semiconductors, metals, and glasses; electron microscopy: atomic resolution Z-contrast STEM; electron energy loss spectroscopy; coherent diffraction.

Xudong Wang  
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Nanomaterials growth and characterization; piezoelectric nanogenerators and piezotronics; photovoltaic and photoelectrochemical devices; nanomaterials for energy storage; nanoelectronics; nano-biomaterials.

Materials Advantage Undergraduate Organization Advisor

John H. Perepezko  
Bascom Professor Materials Sci & Eng  
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Phase transformations; interface reactions / coating design; metastable and amorphous phases; kinetics; nucleation; metal powders and high temperature inter-metallic alloys; rapid solidification; microgravity processing.

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