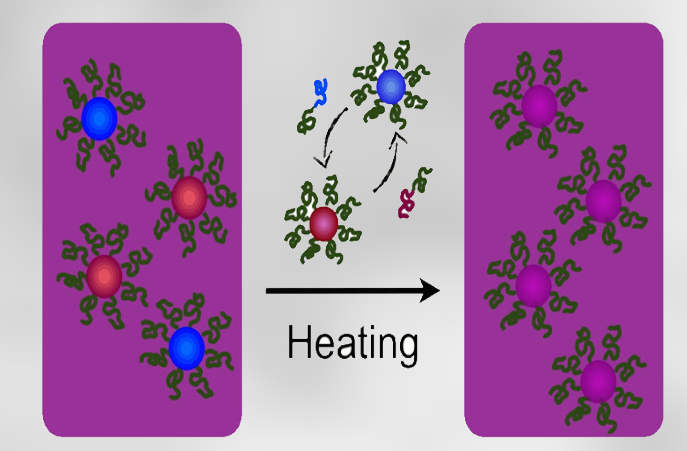


*A comprehensive center that integrates interdisciplinary materials research with innovative outreach to inspire excellence in all aspects of science and engineering*

### Interdisciplinary Research

• **IRG-1: Engineered Multiblock Polymers**

Multidomain Aqueous Assemblies  
 Tailored Membrane Materials  
 Coating and Extrusion Processes



• **IRG-2: Organic Optoelectronic Interfaces**

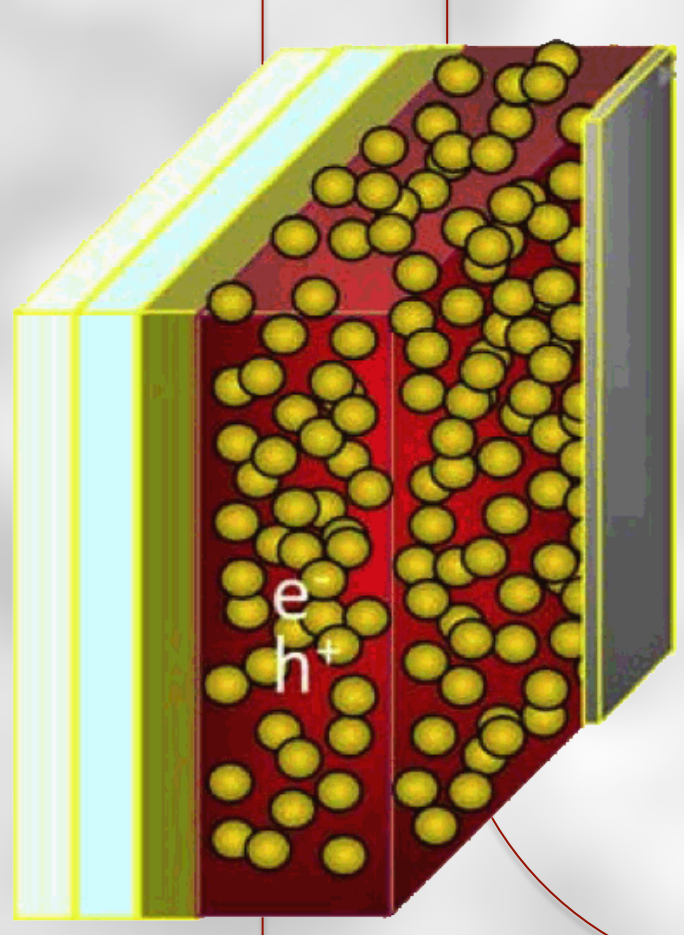
Next-Generation Flexible Electronics  
 New Materials for Organic Transistors  
 Electronic Structure and Carrier Dynamics

• **IRG-3: Magnetic Heterostructures**

Spin Transport  
 Spin Transfer Torque: Materials and Dynamics  
 Highly Polarized Materials

• **IRG-4: Nanoparticle-Based Materials**

Photovoltaics  
 Solid State Lighting



### Partnerships and Collaboration

**IPRIME**

Industrial Partnership for Research in Interfacial and Materials Engineering  
 University/Industrial collaboration  
 47 Member Companies

**PREM**

Partnership for Research and Education in Materials with the University of Texas-Pan American

**International**

Chinese Academy of Sciences  
 Tohoku University  
 Data Storage Institute, Singapore  
 University Duisburg-Essen

### Outreach

**Summer Research Programs**

- Research Experiences for Undergraduates (REU)
- Visiting Faculty-Student Teams
- Research Experiences for High School Teachers (RET)
- Native American Undergraduate Fellowships

**K-12 Outreach**

- Demonstration teams
  - Physics Force
  - Energy and U
- Materials Week Summer Camp

**Mentoring and Community Outreach**

- Mentoring Opportunities for Graduate Students and Postdocs
- Science Museum of Minnesota
  - NISEnet
  - Exhibit Development

**Seed Projects**

Ab initio modeling of electronic transport properties of  $\pi$ -conjugated organic oligomers in molecular junctions

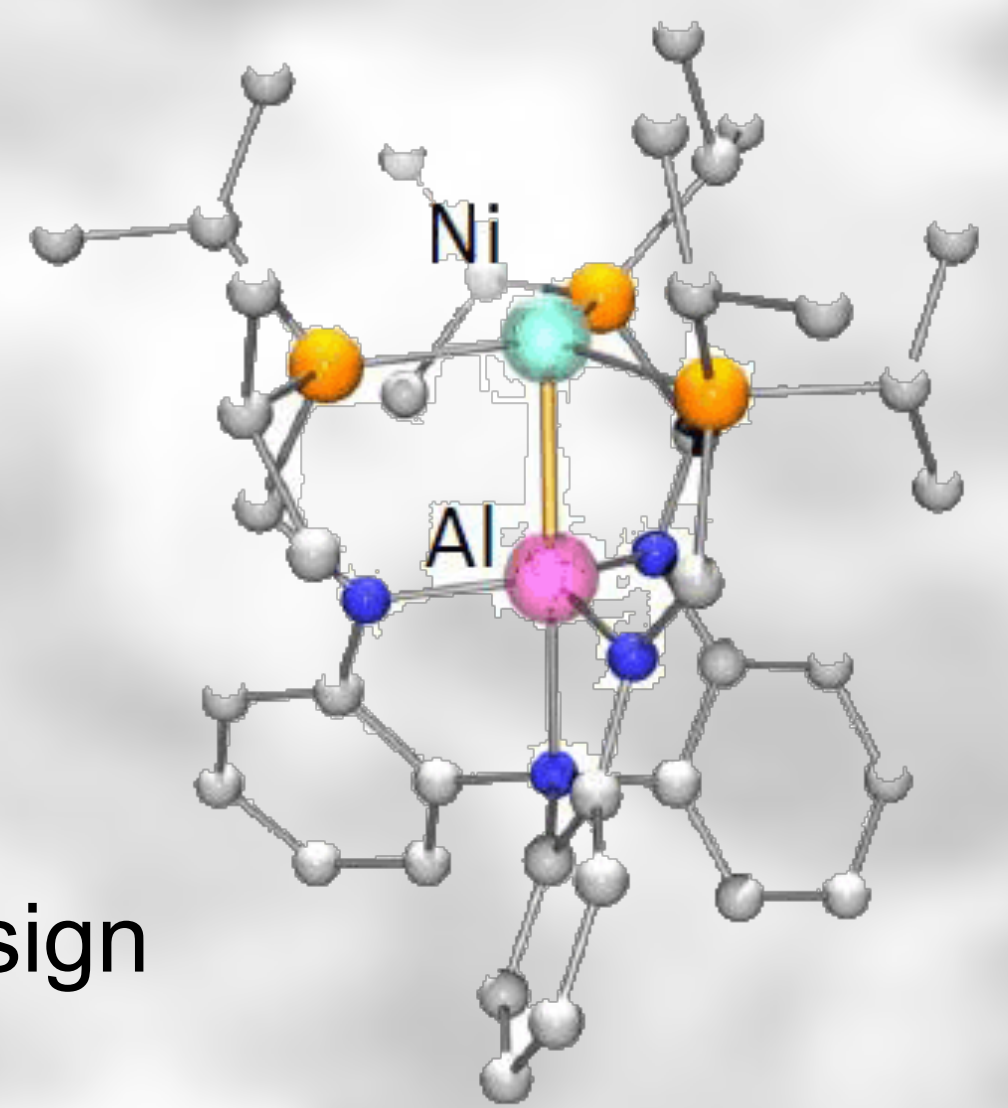
Developing Bimetallic Catalyst Materials with Hierarchical Structure

Band-Engineered Complex Oxide Heterostructures

Responsive Magnetoplasmonic Imaging Agents and Molecular Rulers

Atomic Level and Nanoscale Design of Molecular Sieve Catalysts

Heterogeneous integration of flexible silicon photonics on polymeric films



### Shared Experimental Facilities

- CSE Characterization Facility
- Nanofabrication Center
- Mass Spectrometry Facility
- X-ray Crystallographic Laboratory
- Polymer Synthesis Facility
- Polymer Characterization Facility
- Materials Research Facilities Network (MRFN) - Charter Member