MATERIALS RESEARCH CENTER (MRC)

Straumanis-James Hall William G. Fahrenholtz (Director) Senior Investigators

R. Brow (MSE), W. Fahrenholtz (MSE), G. Hilmas (MSE), Y. S. Hor (Physics), J. Medvedeva (Physics), S. Minteer (Chem), R. O'Malley (MSE), J. Switzer (Chem), X. Yang (MAE).

Research Investigators

L. Alagha (Mining), B. Bai (GE), L. Bartlett (MSE), D. Bristow (Mech), M. Buckley (MSE), C. Castano (Nuc), A. Choudhury (Chem), F. Dogan (MSE), H. El-Azab (Chem), A. Emdadi (MSE), M. Esmaeelpour (EE), R. Glaser (Chem), J. Graham (Nuc), G. Grubbs (Chem), Y. Gu (MSE), H. Hodovanets (Physics), C. Johnson (Mining), C.S. Kim (ECE), D.H. Kim (EE), H. Kim (Physics), A. Kumar (MSE), F. Liou (Mech), D. Lipke (MSE), J. Liu (Civil), M. Locmelis (Geo), C. Lonergan (MSE), D. Ludlow (Chem E), H. Ma (Civil), M. Moats (MSE), V. Mochalin (Chem), J. Myers (Civil), M. Nath (Chem), J. Newkirk (MSE), M. O'Keefe (MSE), M. Okoronkwo (Chem E), J. Park (Mech), F. Rezaei (Chem E), J. Schlegel (Nuc), J. Smith (MSE), J. Smith (Chem E), L. Sotiriou-Leventis (Chem), R. Wang (Chem), J. Watts (MSE), M. Wei (GE), H. Wen (MSE), J. Winiarz (Chem), G. Xu (Mining), H. Yang (Chem E), W. Yang (GE).

The Graduate Center for Materials Research was established for the purpose of promoting multidisciplinary research on materials and providing improved centralized laboratories and specialized equipment for faculty and students involved in materials research. The Center provides graduate students in many academic departments (e.g. Materials Science and Engineering, Chemical and Biological Engineering, Mechanical and Aerospace Engineering, Chemistry, Biological Sciences and Physics) with advanced training in materials related engineering and science research.

The research conducted in the Center ranges from fundamental science to applied engineering and includes the development, evaluation, application, and understanding of metals, polymers, biomaterials, electronic materials, ceramics and composites.

Accomplishments from the Center include: glass microspheres for treatment of liver cancer, transparent composites for windows/armor, environmentally friendly corrosion coatings, laser glasses, epitaxial chiral surfaces, biomineralization, fuel cell electrolytes and sealing materials, electrochemical biosensors, multi-layer nano-capacitors, enhanced magnetic materials, and thin film electromagnetic probes. Center research led to the establishment of small companies based on university technologies and resulted in several patents that generate significant licensing income for campus.

The Center is located in Straumanis-James Hall, a four-story building with 30,000 square feet of laboratory and office space. The Center contains the modern equipment needed for research on materials development, characterization and evaluation, and for measuring common mechanical, thermal, electrical, and optical properties. It contains specialized and adaptable experimental facilities for.

- Additive manufacturing
- Advanced Structural Ceramics including Ultra-High Temperature Ceramics

- Biomaterials
- Corrosion and Coatings
- Electrodeposition/Photocatalysis
- Electromagnetic Compatibility
- Energy materials including materials for fission and fusion power generation
- Environmentally friendly materials
- Glass Melting and Processing
- · Integrated Computational Materials Engineering (ICME)
- Nanomaterials (0D, 1D, and 2D materials)
- Optical and photonic materials
- Steels and Metallic Alloys
- Sensors and MEMS Devices
- Characterization of materials by: x-ray diffraction, focused ion beam (FIB) milling, scanning and transmission electron microscopy, scanning tunneling and atomic force microscopy, thermal analysis, optical techniques, x-ray photoelectron spectroscopy, x-ray fluorescence spectroscopy, x-ray microscopy, (3D x-ray microtomography), electron beam lithography, nanoindentation, glow discharge depth profiling

The Center has an active interest in industrial research and economic development suitable for graduate and undergraduate student education that falls within the technical expertise of the staff.

E-mail mrc@mst.edu or visit our website at http://mrc.mst.edu.