Materials Science & Engineering Program at a Glance

- Over 90 graduate students (>70 full-time • PhD students)
- Over \$2.5 Million in research expenditures • in 2011
- Several multiple > \$1 million awards from ٠ Department of Energy, a \$7.3 million dollar Multidisciplinary University Research Initiative (MURI) award from the Office of Naval Research, Graduate Assistance in Areas of National Need (GAANN) award from the Department of Education.
- Over 90 ISI publications in 2011 ٠
- Local industry includes United Technologies Corporations (Pratt & Whitney, Sikorsky, Otis, Hamilton Sunstrand, UTC Power), Electric Boat (a division of General Dynamics), Praxair, General Electric, FuelCell Energy, Pfizer, etc.

About UConn

The University of Connecticut stands among the top 20 public institutions in the nation. It is currently undergoing a state-funded \$2.3 billion infrastructure improvement plan that includes a new state-of-the-art engineering building that will house laboratories for transformational research and education in strategic areas such as energy, informatics, nanotechnology, biotechnology, security and sustainable engineering.

The student diversity continues to increase, as does the number of honors students, valedictorians, and salutatorians who consistently make UConn their top choice.

UConn is midway between New York City and Boston for easy visits.

Boston: 75 minutes

NEW YORK

New York City: 150 minutes

Hartford .

CONNECTICUT

Bradley International Airport: 40 minutes

MASSACHUSETTS

Storrs

Boston



MATERIALS SCIENCE & ENGINEERING

GRADUATE PROGRAM





Materials Science & Engineering Program 97 North Eagleville Road Unit 3136 Storrs, CT 06269-3136 Phone: 860.486.4620 Fax: 860.486.4745

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Research

<u> 3raduate</u>

Biomaterials

Ceramic and polymer-ceramic composite materials for orthopedic and dental implants, bone repair, delivery of bone regenerative drugs and coatings for titanium-based implants. Some students may work at the UConn Health Center; others in the Interdisciplinary Materials Science and Engineering.

Electronic Materials

Ferroelectric materials and thin film devices, dielectric and piezoelectric ceramics, high-energy density capacitors, gate dielectrics, conducting oxides and photonic crystals.

Nanostructured Materials

Nanolithography, nanofabrication, and nano-manipulation of materials, high temporal resolution scanning probe microscopy measurements of materials properties at the nanoscale, assembly of low dimensional nanostructured materials including quantum dots, nanowires and other novel structures, studies of defects, interfaces and related nanoscale phenomena in metals, ceramics and semiconductors using analytical and highresolution electron microscopy techniques.

Facilities

The Institute of Materials Science (IMS) is a 95,000 sq. ft. advanced research facility that maintains state-of-the-art equipment and instrumentation supporting a full range of materials research activities, including synthesis and processing, characterization, property measurements, and computation.

The Center for Clean Energy Engineering (C2E2) is a School of Engineering facility dedicated to research, development and demonstration of sustainable energy systems.

The Booth Engineering Center for Advanced Technology (BECAT) is a centralized computing research and development facility.

Materials Theory & Modeling First-principles studies of metals,

semiconductors, insulators and composite materials, constitutive modeling of coupled interactions in graded thin film and multilayer ferroic heterostructures, thermodynamic theory of transformational phenomena and microstructure evolution in ferroelectric materials.

Materials in Energy & the Environment

Design and development of materials and systems for solid oxide and PEM fuel cell, photovoltaic, hydrogen storage, and energy transduction applications.

Materials Synthesis & Processing

Particle growth by soft chemical and solution crystallization methods, thin film growth by metal-organic decomposition and pulsed laser deposition, solid free form fabrication and joining of ceramics, deformation processing of amorphous metal alloys, metal alloy casting and solidification processes, ion implantation, laser processing of metals and ceramics.

Structural Materials

Structure-property-processing relations in conventional metal alloys and superalloys, bulk metallic glasses, thermal barrier coatings and radomes.

C. Barry Carter

TEM, SEM and AFM

Bryan Huey

D. Phil., Oxford University (1976)

MRS Student Chapter Advisor

Scanning Probe Microscopy,

Ph.D., U of Illinois (1997)

Ph.D., Univ. of Pennsylvania (1999)

Nanoscience, Electronic Materials, Textures & Ceramics **Ramamurthy Ramprasad**

Materials Modeling & Computation,

Nanomaterials. Thin Films & Interfaces

Sc.D, Cambridge University (2005)

Interfaces & Defects: Nanomaterials:

Material Science & Engineering Program Faculty

S. Pamir Alpay, MSE Program Director Ph.D., University of Maryland (1999) Ferroic Materials. Thermodynamics and Kinetics of Phase Transformations, Conducting Oxides & Thin Film Deposits

Avinash M. Dongare

Ph.D., University of Virginia (2008) Atomistic, Meso-Scale & Multi-Scale Modeling, Multiphase Bulk Material, Interfaces, and Surfaces across Multiple Scales

Theodoulos Z. Kattamis ScD., MIT (1965) Solidification and Metals Joining, Materials Processing, Thin Coatings & Tribology

George A. Rossetti Jr. Ph.D., The Pennsylvania State U (1993) Electroceramic Materials, Crystal Chemistry and Physics & Ceramic Processing Science

Mark Aindow Ph.D., University of Liverpool (1989) Defects and Interfaces, Microstructural Development in Allovs and Thin Films & Electron Microscopy

Puxian Gao. Chair of Graduate Program Ph.D., Georgia Tech (2005) Nanomaterials Synthesis, Characterization and Manipulation, Nanotechnology for Energy, **Environmental & Biomedical Applications**

Harris L. Marcus, Director IMS Ph.D., Northwestern University (1966) Freeform Fabrication, Mechanical Behavior, Fatigue, Nanotechnology & Photonic Crystals

Prabhakar Singh Director, C2E2 Ph.D., University of Sheffield (1978) High Temperature Materials, Oxidation and Corrosion, Electrochemistry, Fuel Cells

Harold D. Brody Alpha Sigma Mu Chapter Advisor Sc.D, MIT (1964) Materials Processing, Allov Casting and Solidification & Process Models

Rainer Hebert

Materials Advantage Chapter Advisor Ph.D., U of Wisconsin-Madison (2003) Phase Transformations, Metals & Alloys, Metalic Glasses & Severe Plastic

Radenka Maric

Ph.D. University of Kyoto (1996) Novel Materials for Fuel Cells & Batteries, Processing Materials, Aerosole & Flame Synthesis

Mei Wei

Chair of Undergraduate Program Ph.D., U of New South Wales (1998) Biomaterials, Ceramics, Coatings & Composites

Additional Faculty in Material Science & Engineering Graduate Program

A. Jon Goldberg Director, Center for Biomaterials, UConn Health Center Ph.D., University of Michigan

Yusuf Khan, UConn Health Center Department of Orthopaedic Surgery Ph.D., Drexel University (2005)

Trent Molter, C2E2 Ph.D., UConn (2008)

Brian Willis Chemical Engineering Ph.D., MIT (1999)

Hanchen Huang Mechanical Engineering Ph.D., U of California, LA (1995)

Liisa T. Kuhn UConn Health Center Center for Biomaterials Ph.D., U of California (1992), SB

Lakshmi Nair UConn Health Center Department of Orthopaedic Surgery Ph.D., SCTIMST (1999)

Menka Jain Department of Physics Ph.D., University of Puerto Rico (2004)

Mechanical Engineering Ph.D., U of Wisconsin-Madison (1978)

Sangamesh Kumbar UConn Health Center Department of Orthopaedic Surgery Ph.D., Karnatak University (2003)

Syam Nukavarapu UConn Health Center Department of Orthopaedic Surgery Ph.D., Indian Institute of Science (2003) Eric H. Jordan

Jeff McCutcheon Chemical Engineering Ph.D., Yale University (2007)

Richard Parnas Chemical Engineering Ph.D., U of California, LA (1996)

