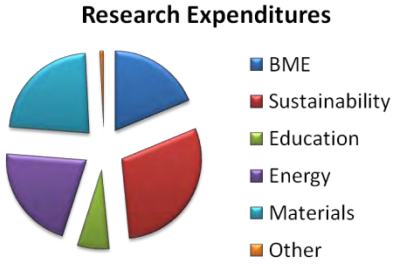
University of Houston Cullen College of Engineering
Cluster Project Overview
Materials



Materials research, specifically on the nano and atomic scales, has long been a transdisciplinary strength at the Cullen College. More than 15% of total research expenditures for FY10 were invested in project such as:

Nanomagnetic Storage
Dmitri Litvinov, Jack Wolfe, Paul Ruchhoeft (ECE), Center for Integrated Bio and Nano Systems
Funded by the National Science Foundation, National Institutes of Health, U.S. Office of Naval Research and Information Storage Industry Consortium

With the goal of furthering the data storage industry, Litvinov and CIBNS researchers are working to create a nanopatterned medium recording method to overcome current data storage limitations. In fact, as early as next year, the industry could reach the superparamagnetic limit, a point where the shrinking of magnetic bits in recording media becomes unstable, resulting in data loss. The CIBNS group is attempting to assemble magnetic nanoparticles on a small scale through the development of instruments and by redesigning materials.

Nanopantography
Vincent Donnelly and Demetre Economou (ChBE), Paul Ruchhoeft (ECE)
Funded by the National Science Foundation

A method developed at UH, nanopantography is a process allowing the minute fabrication of nanotech devices as small as 10 to 20 nanometers. UH researchers are working to better understand how to refine the method, giving way to the mass production of nanodevices and carbon nanotube electronics.

Pizeoelectrics
Pradeep Sharma (ME) and Ramanan Krishnamoorti (ChBE)
Funded by the National Science Foundation

Research is underway to fabricate and enhance piezoelectric properties—materials that generate electricity when placed under physical stress. Such materials can be used to harvest energy from the often wasted energy generated by cars and footsteps and power such things as portable electronic devices. Sharma and Krishnamoorti are working to understand the mechanics of piezoelectric materials through atomistic modeling to determine the best suited material for the development of piezoelectric nanostructures.