magnetostrictive materials, ferromagnetic shape memory alloys, and magnetorheological fluid based devices. Some projects currently under way include work on development of interfacial force sensing systems using magnetostrictive and vibration technology for rotorcraft gearboxes and airframes. The Center held its first annual conference this global economy. The work being done at the Smart Vehicle Concepts Center is supported and monitored by a consortium of companies and government laboratories with international influence. Center Members of the consortium—which has surpassed NSF’s fundraising goals for the first year—pay an annual membership fee, allowing them to have representatives on the Industrial Advisory Board. “The key to innovation is a multidisciplinary, multi-disciplinary focus on active material based composites, piezoelectric and experimental study of automotive belt drives, To learn more about the Dynamics and Vibrations Lab visit: www.mecheng.osu.edu

The Ohio State University
Science
Mechanical Engineering Department

Dynamics and Vibrations Lab

The recent completion of mechanical engineering faculty of Ohio State is in a prime location to improve and nurture the discovery, and to benefit from the discipline. We are currently in the midst of a very exciting transition, as the Center continues to change and improve. The Center, which fruitful interfaces between faculty and student researchers, the academics, and the industrial research and development community.

In order to help us to continue to model technology and research and come to fruition and operational inter-level inter-ministerial working, the Center for Interdisciplinary Research on Active Materials and Structural Systems, faculty had recently approved the funding of a small number of full-time Interdisciplinary Faculty Research Associates. Interdisciplinary Faculty Research Associates allow the Center to address a broad range of interdisciplinary research issues from the national and international scientific community.

The Center for Interdisciplinary Research on Active Materials and Structural Systems center continues a long tradition of departmental activities to motivate fundamental problems involving material modeling, material development, and systems science.

The Ohio State University’s Dynamics and Vibrations Laboratory

Solving Noise and Dynamic Failure Problems

Ohio State’s Dynamics and Vibrations Laboratory:

Visit us at: www.mecheng.osu.edu

Our department has had long standing interests in the area of active material based composites, piezoelectric and experimental study of automotive belt drives, To learn more about the Dynamics and Vibrations Lab visit: www.mecheng.osu.edu

An NSF-supported Industry University Cooperative Research Center. It is directed by Professor Raj Singh and focuses on active material based composites, piezoelectric and experimental study of automotive belt drives, To learn more about the Dynamics and Vibrations Lab visit: www.mecheng.osu.edu

Rob Parker, professor of mechanical engineering, adds, “The incredible benefits of smart materials research include not only cost savings and weight reductions, but they can also make vehicles safer and increase fuel efficiency.

The smart material applications investigated at SVC are bringing lighter, more intelligent materials to vehicle design—thanks to a multi-year grant from the National Science Foundation (NSF). This grant, at a cost of $3 million, is enabling researchers at SVC to investigate the uses of magnetostrictive and ferromagnetic shape memory alloys in devices ranging from tiny motors to large scale actuators.

Our department has had long standing interests in the area of active material based composites, piezoelectric and experimental study of automotive belt drives, To learn more about the Dynamics and Vibrations Lab visit: www.mecheng.osu.edu
Turning Wasted Heat into Electricity

Recent Faculty Recognitions

Rebecca Dupai
The National Science Foundation (NSF) has awarded Dr. Dupai a $448,000-$476,000 Research Initiation Grant (RII) for her project titled “Highly efficient and scalable multi-material energy harvesting system” (1451369). The project, which is in collaboration with researchers from Swiss Federal Institute of Technology, Politecnico di Milano (Italy), Texas A&M University and the University of Florida.

Mohammed Samniny
He has been awarded the Society for Experimental Mechanics’ (SEM) 2010-2011 Young Investigator Award (YIA). The YIA is presented annually to both academic and industrial engineers to recognize distinguished early-career research contributions in the field of experimental mechanics. Dr. Samniny has also been recognized by the American Institute of Aeronautics and Astronautics (AIAA) with the Richard W. Prather Award for Excellence in Flight Research in 2010.

J.W. “Bill” Rich
He has been honored with the 2010-2011 Eta Kappa Nu (IEEE) Distinguished Lecturer Award. This award recognizes individuals who have outstanding technical achievement and have shown the ability to communicate and share their knowledge in a meaningful way. Dr. Rich has been a member of the IEEE since 1989 and has been active in many of its technical societies and organizations.

Nuclear Engineering Update

The Nuclear Engineering Program at The Ohio State University has been awarded a grant from the U.S. Department of Energy’s Office of Nuclear Energy to support the development of advanced nuclear reactor systems. The grant will be used to support research and development activities that focus on improving the efficiency, safety, and performance of advanced nuclear reactors. The project is led by Dr. John D. Macdonald, a professor of mechanical engineering and director of the Center for Advanced Nuclear Systems (CANS).

Other recent highlights include:

- The completion of a new collaborative research facility in support of the U.S. Department of Energy’s Advanced Reactor Technology Program.
- The successful completion of a large-scale experiment on the performance of advanced nuclear fuel designs.
- The development of new computational tools for the design and optimization of advanced reactor systems.

New Faculty Join Department

Heremans’s work gives researchers a new avenue to improve thermoelectric materials that could increase the efficiency of a wide variety of experimental and commercial TE materials. Resonant levels are expected to exist in the entire range of thermoelectric materials, and the precise locations of these resonant levels are expected to vary with the presence and structure of impurities.

Carol Smidts, professor of mechanical engineering, conducts research in the application of advanced laser diagnostics and imaging techniques to combustion and fluid mechanics problems. His primary areas of interest include turbulent combustion, scalar mixing in turbulent reacting and non-reacting flows, fundamental flame chemistry including pollutant (NOx) formation and destruction, bio-fuels and the associated flame chemistry of oxygenated-compounds, multiphase flows including turbulent sprays and spray flames, and lean, premixed combustion. He received his Ph.D. from the University of Texas, Austin.

Lisa Abrams, assistant professor of practice in mechanical engineering, teaches in the area of turbulence and mixing, with emphasis on the application of advanced laser diagnostics and imaging techniques to problems of combustion and fluid mechanics. She has a joint appointment with the Department of Chemistry. Her research focuses on the application of advanced laser diagnostics and imaging techniques to problems of combustion and fluid mechanics.