

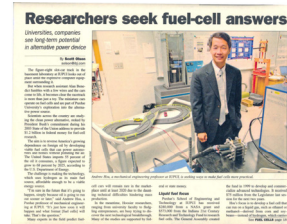
ME Newsletter

Richard G. Lugar Center for Renewable Energy Established

One of the most exciting developments happening in the ME department is the newly established [Richard G. Lugar Center for Renewable Energy](#) (LCRE). It was one of 19 signature centers chosen as the result of an initiative to promote research on campus. A [dedication ceremony](#) was held March 19, 2007 for the LCRE, in which Senator Lugar was present, along with several other distinguished members of the IUPUI faculty and Indianapolis community. The LCRE was established to address the societal needs for clean, affordable and renewable energy sources, improve the nation's energy security, and reduce global warming. Many departments and schools will work in a collaborative effort to promote renewable energy applications through teaching, learning, civic engagement, and synergistic partnerships with industry, government labs and local communities. Dr. Andrew Hsu will serve as the Director of the LCRE. Some current research areas that Dr. Hsu, along with Dr. Rongrong Chen, are working on include renewable energy through fuel cell technology, renewable hydrogen, advanced battery technology, and bio-fuel production and applications. In addition, the LCRE has received a major grant from U.S. Army to develop fuel-cell powered portable devices for the Army. Dr. Hsu's earlier work in fuel cells was featured in the Indianapolis Business Journal in April 2005 as seen here.



Dr. Andrew Hsu, along with Chancellor Charles Bantz and Senator Richard Lugar, celebrate the dedication of the Richard G. Lugar Center for Renewable Energy.



AVML Featured in the Indiana Business Magazine

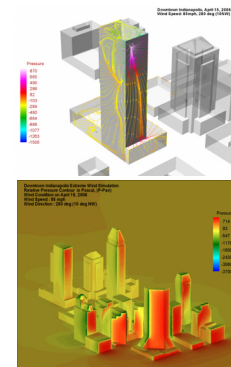


Ph.D. Student, Daniel Aw, featured on the cover of the *Indiana Business Magazine*.

The [Advanced Virtual Manufacturing Lab](#) was featured in the May 2007 edition of the *Indiana Business Magazine*. This project, which is overseen by Dr. Hazim El-Mounayri, focuses on automating the training process of advanced manufacturing employees for CNC machining. This is being explored through the use of a virtual reality web-based software system that utilizes an avatar and 3-D lifelike machine controls, complete with sounds. The program, which includes extensive amount of tutorials, allows students to "practice" their skills via virtual machines. It will be used for advanced manufacturing education in engineering curricula as well as training of CNC machinists. One of our Ph.D. students and alumnus, Daniel Aw, who is working on this project, has been featured on the cover page of the magazine while he was demonstrating the virtual manufacturing system in IUPUI Virtual Reality (VR) theater. He has been working in the development of this teaching and training system during the last few years. The complete article can be found at http://www.engr.iupui.edu/me/news/inbusmag_s07.shtml.

Dr. Hasan Akay Receives the CRL Director's Award for his Work with MURI

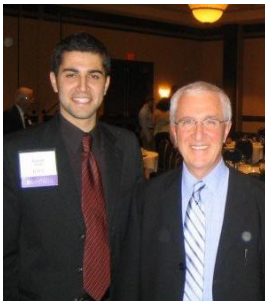
At the Annual Center for Research and Learning (CRL) Awards banquet, Dr. Hasan Akay was presented with the Director's Mentoring Award. He received his award for his outstanding leadership and mentoring of undergraduate research. Dr. Akay serves as the Director for the [Multidisciplinary Undergraduate Research Institute \(MURI\)](#), which is continually growing each year. Since its inception in 2005, approximately 100 students have participated in over 40 multidisciplinary research projects in teams. Engineering & Technology faculty mentors submit proposals for competitive funding to work on one or two semester projects. Students apply to a project of interest and work in teams under a mentor on inter/multidisciplinary research. Projects completed range from *computational fluid dynamics modeling of downtown Indianapolis for extreme wind conditions and air quality studies* mentored by Dr. Erdal Yilmaz of the [Computational Fluid Dynamics Lab](#) to *dynamic 3D tumor respiratory motion modeling in image-guided radiation treatment* mentored by Dr. Huanmei Wu of the Computer and Information Technology Program.



CFD Model of downtown Indianapolis to study One Indiana Tower wind damage in 2005.

Do we have your email address? Send your email address for current information about the ME department to Courtney Wooton at cwooton@iupui.edu.

ME Student Takes IUPUI Top Male Student Award



Top Male Student, Kurush Savabi, pictured with Dr. Akay, Chair of the ME department, at the Top 100 Awards dinner.

The 2006-2007 Top 100 Outstanding Students sponsored by the IUPUI Alumni Association were named in March, including 16 students from Engineering and Technology. Students are awarded with this honor based on scholastic achievement, extracurricular activities on campus, and civic and community service. This year's Top Male Student was ME Senior, Kurush Savabi! Kurush is the second ME student to receive this prestigious honor, joining Vincent Liaw in 2005. Other ME students named to this year's Top 100 list include Brandon Harville, Ibraheem Nezamuddin, Michael Reed (BPMME student), and Breanne Walters. The students who received the outstanding ME senior award in 2006-2007 are Braden Duffin and Alan Benedict. Aaron Huesman received the outstanding ME Junior award.

Self-Healing Polymers featured in the *Journal of the Royal Society Interface*

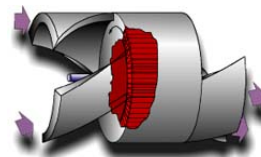
The work on self-healing polymers, led by Dr. Alan Jones, was published in the April 2007 edition of the *Journal of the Royal Society Interface*. This work was featured on the cover of the journal. Encapsulated healing agent along with an initiator catalyst is embedded into a polymer material. When a crack occurs in the polymer, the microcapsules are broken, allowing the healing agent to spill out and contact the catalyst. Polymerization of the healing agent seals the crack shut and dramatically extends the life of the polymer. Dr. Jones is currently working in degradation of fuel cell membranes and continuing work in self-healing polymers.



A broken microcapsule used to deliver healing agents in polymers featured on the cover of the *Journal of the Royal Society Interface*.

Dr. Razi Nalim Receives Rolls-Royce Grant for \$250K

Dr. Razi Nalim received a grant of \$250,000 from Rolls-Royce Liberty Works of Indianapolis to continue research on a new generation of wave rotor combustors for super-efficient aircraft and power plant gas turbine engines. Fuel consumption and greenhouse gas emissions may be reduced by up to 20% if his wave rotor combustor concept succeeds. This would be a remarkable improvement, as there are no viable fuel substitutes for liquid hydrocarbon jet fuel for airplanes. Dr. Nalim is one of the leading experts in the wave rotor technology which is aimed at improving the performance of gas turbine engines and has been working very closely with Rolls-Royce over the past ten years.



Schematic of a wave rotor.

ME 462 Students Compete in National Competition

One group of students from the fall 2006 capstone senior design course, [ME 462](#), is competing in the *2006-2007 National Student Design Competition*. In December, the team received the *Best Design* award from a panel of judges comprised of ME faculty and industry sponsors for their Hospital Back Bed Motion Device. Dr. Jie Chen, instructor of the course, oversaw the design process and serves as a mentor to the team for the competition. Several industry sponsored projects are completed by the students of capstone design course under the mentorship of ME faculty each semester. Some of the recent sponsors include Bishop Steering, Carrier Corporation, Eli Lilly and Co., Oscar Inc., Remy Inc., and Rolls-Royce Corporation.



The group designed a variable speed hospital bed back mechanism and controller were designed to utilize extended physiologic proprioception.

Some Recent Comings and Goings in the ME Department

There have been some changes with the faculty and staff in the department. In fall 2004, Dr. [Sohel Anwar](#), Assistant Professor, joined the department, bringing his knowledge in Mechatronics and Controls. In the summer of 2005, [Dr. Rongrong Chen](#), Research Associate Professor and [Dr. Alan Jones](#), Assistant Professor, joined the ME faculty. While Dr. Chen specializes in Fuel Cells and Advanced Battery Systems, Dr. Jones' research interests lie in Self-Healing Polymers and Elastomers. During the fall 2006 semester, the Administrative Secretary position, previously held by Kelly Koher, was replaced with the Assistant to the Chair position. [Courtney Wooton](#) filled this position after receiving her M.S. in Education from IUPUI. She is coordinating the undergraduate and graduate programs of the department. After 22 years of service to the department, [Dr. Dare Afolabi](#) resigned from his position as Associate Professor at the beginning of the spring 2007 semester to pursue other interests. Currently, two new faculty positions are being filled for the fall 2007 semester. One position will be in Solid Mechanics, while the other will be in Renewable Energy.