

FP_{monthly}

FP_{monthly} - An internal news digest for all center members including industry supporters, researchers, students, and affiliated organizations.

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UPDATES: A team from the National Science Foundation paid a visit to CCEFP headquarters in October to meet with researchers, students and representatives of the Industrial Advisory Board. The two day meeting featured presentations, poster sessions, discussions and recommendations.

☞ Center researchers are honing their research strategies as they work together in preparing a strategic research planning document, to be submitted to NSF at the end of this month.

☞ Center researchers, students and staff participated in the NSF ERC Conference late this fall. This annual event brings together representatives of new and veteran ERCs for two days of brainstorming, sharing and networking. Included were representatives of the Center for Compact and Efficient Fluid Power (CCEFP), Synthetic Biology (SynBERC), Quality of Life Technology (QoLT-ERC), Mid-Infrared Technologies for Health and the Environment (MIRTHE), Structured Organic Composites for Pharmaceutical, Nutraceutical and Agrochemical Applications (C-SOC), all from the class of 2006 ERCs. For more information on Engineering Research Centers <http://www.erc-assoc.org/centers.htm>.

UPCOMING EVENTS: The Center for Compact and Efficient Fluid Power will host its first annual meeting at Georgia Tech on April 11, 12 and 13, 2007. This meeting will serve as an exciting forum to learn about research and communicate with faculty and students associated with each of the center's projects. Presentations will include a panel discussion of the Industrial and Education Advisory Board as well as an overview of each research project within the Center's three thrust areas: Compactness, Efficiency, and Effectiveness. The meeting will hold a Student Poster Show as well lab tours of the Georgia Tech Mechanical Engineering Department. Program and registration information will be available soon on our website: www.fperc.org.



RESEARCH: The vision of the ERC is to transform fluid power so that it is compact, efficient and effective. This will benefit humanity by significantly reducing energy consumption and creating whole new industries. To achieve this vision, the ERC has four goals. The first goal is to dramatically reduce energy consumption in current uses of fluid power. For the United States, 10% improvement in efficiency would save \$7 billion per year. The second goal is to move fluid power into the transportation sector by developing the hydraulic hybrid passenger vehicle. A 10% improvement in the efficiency of automobiles would save \$10 billion per year. The third goal is to create fluid power that is portable, wearable, untethered, autonomous, and capable of operating for long periods without external energy sources, thus creating entirely new uses. The fourth goal is to make fluid power ubiquitous by making it leak proof, quiet, safe and easy to use. In upcoming newsletters you will learn more details about the research strategy and how it is structured to achieve our vision.

INDUSTRY: We are pleased to announce that we recently had an additional four industry companies commit to joining our Center. These companies include MTS, Donaldson, Trelleborg Sealing Solutions, and Shell Oil Company. Not only are each of these new members world renowned experts in their fields, but they are also exceptionally well matched with our strategy of providing the next generation of contamination and leak free fluid power enabled system solutions that will leverage newly engineered fluids. Please join me in welcoming our new members! For more information on industry opportunities contact Michael Gust at 612.624.4956 or mjgust@me.umn.edu.

EDUCATION AND OUTREACH: Support a summer intern! Industrial internships are a centerpiece of the Center and the intern program will be kicked off in summer 2007. We need your company to help make this program a success! One of the best ways your company can contribute to reaching the educational goals of the Center is by offering one or more paid summer intern positions for bright, energetic engineering students from across the country. For information on internship opportunities, contact Alyssa Burger, Education & Outreach Director at 612.624.4991 or aburger@me.umn.edu.

☞ **Project Lead the Way (PLTW)** is an affiliated organization in the CCEFP network. PLTW works with schools to implement an instructional program that prepares students to be successful in post secondary engineering and engineering technology programs. PLTW now reaches more than 170,000 middle and high school students in 46 states. Funded by a grant from the National Fluid Power Association (NFPA), content relevant to fluid power is now being integrated into middle school units (Science of Technology and the Automation and Robotics Unit) and high school courses (Introduction to Engineering Design, Computer Integrated Manufacturing, Biotechnical Engineering, Aerospace Engineering and Engineering Design and Development). Read more about PLTW at www.pltw.org.

GETTING TO KNOW US: The Center would like to introduce its talent. In each issue, get to know the Center's students, researchers and leadership team.



☞ **Student:** Serena Tyson earned her undergraduate degree in systems engineering at the Naval Academy in Annapolis, Maryland and is now a graduate student at the University of Illinois at Urbana-Champaign under the guidance of Professor Andrew Alleyne. While at the Academy, Serena was also commissioned into the Marine Corps and is still on active duty while completing her master's degree at UIUC. After completing her degree, Serena will return to Quantico, Virginia for six months of basic training and then pursue flight school in Pensacola, Florida to earn her wings. Serena's research at UIUC includes designing a pneumatically controlled ankle brace to aid and/or support an individual with disabilities. She is studying preliminary options for a linear or rotary actuated device that helps prevent the foot from dropping after a heel strike. The long-term goal of this research will be a device that aids in the push off motion after a complete heel-to-toe movement. Outside of the lab, Serena enjoys her relaxation time by reading and being outdoors, as well as remaining physically active by working out and running.



☞ **Researcher** Professor Kenneth Cunefare earned his undergraduate mechanical engineering degree from the University of Illinois followed by a masters in acoustical engineering from the University of Houston. After a six year stint with Exxon, he completed his education at Penn State in 1990 by earning his PhD in mechanical engineering with an emphasis in acoustics and noise control. Ken then assumed a post doc assignment at the Technical University of Berlin for one year and after returning to the states, he arrived at Georgia Tech in July of 1991 to begin research in the areas of acoustics and vibrations. His interests within the ERC are noise and vibration reduction utilizing a passive approach so that no external energy sources are required thus resulting in a more economically robust overall solution. In addition to this research, Ken is looking at new creative solutions for acoustics with HVAC ducts, suppression of a brake squeal and active control of large space structures. Outside of the lab, Ken enjoys fishing striped or rock bass and trout, scuba diving and reading histories. He also engages in a mean game of racquetball and makes good use of his private pilot's license!

Please send comments, questions, or submissions to:
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☞ **Leadership Team** Professor Monika Ivantysynova earned both her masters and PhD in mechanical engineering in 1979 and 1983, respectively, from Slovak Technical University of Bratislava, Czech Republic. Following her education, Monika spent seven years in industry as a R & D project engineer for the design and development of pumps and motors and hydraulic drive systems. In 1991 Monika returned to academia at Technical University of Hamburg-Harburg, Germany where she conducted research on aircraft hydraulics specifically new actuators on primary flight controls for the Airbus A380. In 1996, as a full professor, Monika successfully built her own fluid power lab at the Duisburg University in Germany and eventually took this research on the road to Technical University of Hamburg-Harburg, Germany. While at Hamburg, Monika and her husband co-authored a book on "Hydrostatic Pumps and Motors: Principles, Designs, Performance, Modelling, Analysis, Control and Testing". In August 2004, Monika again took on a major new challenge by moving her entire lab from Germany to USA and forming a new team of researchers at Purdue University in Indiana focused on fluid power. She currently has 10 masters students and 8 PhD candidates. Monika continues her research she started in Germany on energy saving hydraulic drive systems and the development and optimization of pumps and motors by multidomain computer simulation. Within the ERC she serves as the Center's leader for Thrust 1: Efficiency. Outside of the lab, Monika enjoys a wealth of activities outdoors including gardening plants and vegetables. She also enjoys tennis, swimming and dancing. Monika has recently found a passion for skiing in Colorado and went to Vail twice in 2006!

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