

PSU/ETIC Success Story

PSU has seen a 39% growth in engineering and computer science degrees granted since the 2001-02 academic year. In addition to the goal of expanding the number of graduates, ETIC is pursuing the goal of developing programs of national ranking and quality. PSU has embraced this goal aggressively. In 2005, the **Computer Science** department hired 10 new tenure-track faculty – a 50% increase in its ranks. With the completion of the new engineering building on campus, PSU is now busy building lab space to facilitate the faculty's research. The goal of this venture is to create a Computer Science department that is ranked in the top 40 nationally in terms of Research and Development expenditures, and which produces \$5 million in sponsored research annually. As of the 2005-06 academic year, the department is over half-way to meeting this goal.



Professor David Maier (left) is a key player in this venture and is clearly a faculty member of national stature. David graduated from Princeton University in 1978 and received a NSF Presidential Young Investigator Award. He is the Maseeh Endowed Professor in Emerging Technologies at PSU and is regarded as one of the five best database researchers in the country.

The **Northwest Center for Engineering, Science and Technology** at PSU houses the **Biomedical Microdevices and Nanotechnology Laboratory** where Electrical and Computer Engineering Assistant Professor Shalini Prasad studies very small “nanomaterial” in order to impact such areas as medical diagnostics, the environment, and bio-defense applications.



Shalini Prasad (left) with graduate assistant Ravi K. Reddy.

Her work is done in collaboration with other disciplines at PSU—chemistry and physics—as well as researchers from Oregon Health and Sciences University, OHSU/OGI School of Science and Engineering, and Oregon State University. Together they form the Oregon Nanomedicine Interdisciplinary Research Group.



Dr. Lisa Zurk, Associate Professor of Electrical and Computer Engineering leads the **Northwest Electromagnetics and Acoustics Research Laboratory (NEAR-Lab)** where research projects have applications to a broad range of critical problems including remote monitoring and assessment for disaster relief, detection of explosive devices, port and coastal security networks, biomedical sensors for patient monitoring, and monitoring of critical environmental components such as salmon population, coral reefs and water resources.



Jorge Quijano, PhD student in the NEAR-Lab participates in a Navy sponsored Shallow Water Experiment.

Intelligent transportation systems involve the creative integration of information processing, sensors, communications, controls and electronics to solve highway, transit, bicycle, pedestrian and freight transportation problems. PSU is combining these technologies in innovative ways and integrating them into our multimodal transportation system to save lives, time, and resources. As Director of the **Intelligent Transportation Systems Lab** at PSU, Professor Robert Bertini and his students conduct research on: Oregon's major freight corridors, safety effects of roadway illumination, motor vehicle fatality and injury rates, speed reduction technologies and traffic signal improvements.

Financial leverage is a concept Bertini knows well. He was instrumental in the effort to bring a new \$16M National University Transportation Center to PSU. The **Oregon Transportation Research and Education Consortium (OTREC)** is a partnership between PSU, UO, OSU, and OIT. OTREC is dedicated to stimulating and conducting collaborative multi-disciplinary research on multi-modal surface transportation issues; educating a diverse array of current practitioners and future leaders in the transportation field; and encouraging implementation of relevant research results.



Professors Rob Bertini and Chris Monsere monitor traffic flows in the Portland metropolitan region.





With help from astronauts aboard the International Space Station, Professor Mark Weislogel in the Mechanical and Materials Engineering department is conducting research on fluid flow in micro-gravity environments. Weislogel's group of experiments, known collectively as the **Capillary Flow Experiment**, is one of only three projects selected by NASA as the result of a nationwide "fast to flight" effort to create alternative small-scale, hand-held experiments in the wake of the space shuttle Columbia tragedy.



Astronaut Jeff Williams and the PSU Capillary Flow Experiment (CFE).

With funding from the Ecoworks Foundation, the City of Portland, and Gerding Edlen Development, a PSU research team including professors in the Mechanical and Materials Engineering department will conduct experiments and develop computer models to assess the energy savings and stormwater abatement benefits of ecoroofs. This engineering research will be combined with an economic modeling effort conducted by PSU Environmental Studies Program.



Ecoroof atop PSU's Broadway Building

The combined result will be integrated into a design tool allowing building professionals to evaluate the right plants, soil, and a host of other critical factors, including cost, to ensure the best roof performance for the local conditions, design, and business objectives.

