UWM Research Foundation
Catalyst Grant Program Update
January 2011

UWMRF Announces Latest Rockwell Catalyst Grants

The Research Foundation at the University of Wisconsin–Milwaukee (UWM) has recently announced four new Catalyst Grants in Advanced Automation sponsored by the Rockwell Automation Charitable Corporation. These grants are made possible by $180,000 from the Rockwell Catalyst Program with additional support from the UWM Graduate School.

Nano-Laminate Coatings

Carolyn Aita, Ph.D., Professor, Department of Chemistry and Biochemistry

Dr. Carolyn Aita is a recognized expert in the area of nano-coatings, and received a Rockwell Catalyst Grant in 2007 in the first round of the program. This project, "Nanolaminate coatings as substitutes for chromate conversion coatings for protection of electrogalvanized steel," extends her previous work reactive sputter deposition to the development of new processes and coatings that can be easily scaled up for manufacturing; these coatings address environmental problems with chromate coating typically used in galvanized steel and may be extended to high-end coating for biomedical applications.

Aeration System for Water Treatment

Ryo Amano, Ph.D., Professor, Mechanical Engineering, CEAS

Dr. Ryo Amano has a long research history in areas that include computational fluid dynamics (CFD), process engineering and manufacturing material processes. The goal of this project "Development of Energy Efficient Fine Bubble Aeration System for Wastewater Treatment," is to develop a new, more efficient technology for aeration in wastewater treatment systems. The project builds on Dr. Amano's insights into the formation of bubbles and the surface energy of the materials used for the diffuser plates. There is a significant amount of energy used in municipal waste water treatment plants to aerate water; this project which employs both prediction and experiments has the potential to substantially reduce that energy.

Laser-Assisted Manufacturing for Energy Components

Tien-Chien Jen, Ph.D., Professor, Interim Dean of the College of Engineering & Applied Science

This project is focused on advanced energy storage devices and addresses the manufacturing of one of the most important components of a fuel cell, the bipolar plate. Dr. Tien-Chien Jen and his colleague, Dr. Frank Pfefferkorn will collaborate on this project titled, "Laser-Assisted Cold Gas Dynamics Sprayed Graphite-Coated Bipolar Plate for PEM Fuel Cell," which will explore an improvement the coating process cold gas dynamic spraying, using lasers to improve the penetration depth. The process may prove to be an important advance in fuel cell materials.

Photonic Computing …

Ramin Pashaie, Ph.D., Assistant Professor, Department of Electrical Engineering and Computer Science

Dr. Ramin Pashaie joined UWM in 2009 and is building a research program in Optics and Photonics. This forward looking project, "High Performance Parallel Nonlinear Photonic Processor on Photorefractive Crystal Substrate," will help develop a new parallel non-linear processor on a photorefractive crystal. This technology could help enable the next generation of computational devices.

Rockwell Catalyst Grant Program Status. The Rockwell Catalyst Grant Program has completed four phases of catalyst grant awards and made two additional awards through the Wisconsin Energy Research Consortium (formerly known as Southeastern Wisconsin Energy Technology Research Center) as shown below. For each project, success is measured in terms of research and scholarship, intellectual property development, corporate partnering and startups.