

Research Fellow Awards – Fall 2008

In December 2008, the UWM Research Foundation announced its first seven awards under the Research Fellowship program. Following is an update on these award recipients.

Sponsoring PI: Luis Anchordoqui, Ph.D., Assistant Professor, Physics
Research Fellow: Lisa Goggin, Ph.D., Post-Doctoral Research Assistant
Research Area: *Search for Gravity Wave Signatures*

Luis Anchordoqui and post-doctoral research assistant, Lisa Goggin, are part of UWM's internationally recognized LIGO group. LIGO, which stands for Laser Interferometer Gravitational-Wave Observatory, is an ambitious physics project which aims to detect gravitational waves which were predicted by Albert Einstein, but have not yet been observed in practice. Dr. Goggin's work is specifically focused on looking for a particular signature of gravity waves called a cavity ringdown signature which is predicted to occur when two objects such as black holes collide. She has recently published a paper in Physical Review D which for the first time brought together collaboration partners from around the world to analyze data from an array of sensors in search of a ringdown signature.



UWMRF Research
Fellow, Dr. Lisa Goggin

Sponsoring PI: Jian Chen, Ph.D., Assistant Professor, Chemistry
Research Fellow: Ryan Kohlmeyer, Ph.D. student, Graduate Research Assistant
Research Area: *Organic Nanomaterials*



Ph.D. student and Research Fellow, Ryan Kohlmeyer discusses his work with UWM Foundation Board Director Art Smith.

Jian Chen's research is focused on organic nanomaterials and their applications in the areas of alternative energy, smart materials, and biomedical materials and devices. Research Fellow, Ryan Kohlmeyer is a Ph.D. student in Dr. Chen's laboratory. His work contributed to an accepted publication in the "Journal of Physical Chemistry C" where they demonstrate the production of high dielectric constant materials based on carbon nanotubes. These materials could lead to extremely compact biomedical devices or a next generation of electronic devices. Ryan is also working on carbon nanotube aerogels – extremely low density materials which can be capable of supporting almost 2000 times their own weight, and he soon hopes to turn his attention to alternative energies by applying knowledge of organic chemistry to the production of organic solar cells. Ryan continues to collect data that will contribute to his Ph.D. thesis.

**UWM Research Foundation
Research Fellows Award Winners**



Sponsoring PI: Junhong Chen, Ph.D., Associate Professor, Mechanical Engineering
Research Fellow: Bo Zhang, Ph.D., Post-Doctoral Research Assistant
Research Area: *Nanotechnology Applied to Environmental Protection*

Junhong Chen's research interests include the fabrication of novel nanostructures for use in gas sensors and biosensors and corona discharges and plasma reacting flows. Dr. Bo Zhang, UWMRF Research Fellow and post-doctoral research assistant, has been working with Dr. Chen in environmental nanotechnology, or the application of nanotechnology for environmental protection purposes. His work has focused on the prediction of ozone generation vt corona electrostatic devices, and the minimization of ozone emission with using nanoscale corona discharges. Based on this work, Dr Zhang has submitted one manuscript for publication and is preparing a second. His future work will research aspects of environmental nanotechnology, such as the application of nanocatalysis and nanosorption on gaseous pollutant emission control.



UWM Research Fellow, Bo Zhang discusses his work with UWMRF Board Director Sujeet Chand.

Sponsoring PI: Yi-Qiang (Eric) Cheng, Ph.D., Assistant Professor, Biological Sciences
Research Fellow: Vishwakanth Potharla, Ph.D. student, Graduate Research Assistant
Research Area: *Novel Compounds for Treatment of Cancer*

Yi-Qiang (Eric) Cheng's research is focused on new methods and platforms for the discovery and engineering of pharmaceutically relevant microbial natural products as drugs or drug leads. FK228 is a very potent new anticancer drug that inhibits histone deacetylases (known as an HDAC inhibitor). Dr. Cheng identified a gene cluster responsible for the production of FK228 and used that knowledge to develop new and novel compounds that may be even more effective. Dr. Cheng used his Research Fellow award to recruit Vishwakanth Potharla to join his program as a Ph.D. student in the spring of 2009. Mr. Potharla is working with Dr. Cheng to analyze the gene function and boundaries of the gene cluster responsible for FK228 production; this work may deepen their understanding of the compounds which are the subject of two UWMRF patent applications.



Dr. Cheng discusses his work with Josh Schafer of Astellas Pharmaceuticals.

**UWM Research Foundation
Research Fellows Award Winners**



Sponsoring PI: **Adel Nasiri**, Ph.D., Assistant Professor, Electrical Engineering
Research Fellow: **Goran Mandic**, Ph.D. student, Graduate Research Assistant
Research Area: ***Innovative Control Techniques for Wind Turbines***

Adel Nasiri's research program focuses on a broad range of energy related topics, including alternative energy and advanced control techniques for wind turbines. Nasiri, working with Ph.D. student and



Ph.D. student and Research Fellow, Goran Mandic presents his work at the UWMRF First Look Forum

UWMRF Research Fellow, Goran Mandic, is investigating the use of ultracapacitors in wind turbine control. Wind energy is growing in importance as an alternative energy source with the increased deployment of wind turbines, but power fluctuations caused by wind speed variations can create significant problems for the electrical grid as well as the wind turbines mechanical systems. Mandic is working to model a novel design to reduce those fluctuations and is preparing a paper on his results to present at an IEEE International Symposium on Industrial Electronics in the summer of 2010. He will eventually validate his simulation work through experiments conducted in Nasiri's lab. Mandic passed his Ph.D. qualification exam in April 2009 and is completing his remaining course work before he turns his attention to his Ph.D. thesis.

Sponsoring PI: **Abbas Ourmazd**, Ph.D., Distinguished Professor, Physics
Research Fellow: Graduate Research Assistant to be identified
Research Area: ***Determining Molecular Structures from the Diffraction Patterns of Single Molecules***

Abbas Ourmazd's research is developing revolutionary techniques to determine the structure and dynamics of single macromolecules. Existing techniques to study these molecules rely on crystallization of molecules to obtain scattered diffraction patterns, but these techniques are severely limited because many molecules of interest, including many proteins, cannot be crystallized. Dr. Ourmazd, working with a team of leading international collaborators has developed new techniques to determine these structures from the diffraction patterns scattered from single molecules. These powerful techniques which resolve the ambiguity of the molecules position have far-reaching implications to analysis of a wide range of problems. This field of research is highly competitive, and Dr. Ourmazd will use the Research Fellow to help recruit a new Graduate Research Assistant to work in his research program.

Sponsoring PI: **Wilfred Tysoe**, Ph.D., University Distinguished Professor, Chemistry
Research Fellow: **Zhenjun Li**, Ph.D. awarded summer 2009
Research Area: ***Surface Chemistry for Palladium-Based Catalysts***

Zhenjun Li received a Research Fellow award in 2008 to support his Ph.D. work under Dr. Wilfred Tysoe in UWM's Department of Chemistry. Dr. Tysoe's research focuses on understanding chemical reactions occurring at surfaces with particular emphasis on catalysis, tribology and on the formation of thin films with tailored properties. Zhenjun Li received support from a UWM Research Fellow award to complete his Ph.D. thesis which examined the role of gold in palladium-based catalysts. The role of catalyst in chemical reactions is of particular interest in energy and environmental research, and this work has been part of eleven published or accepted manuscripts. In the summer for 2009, Dr. Li received his Ph.D. and has since moved to the Pacific Northwestern National Laboratory as a post-doctoral researcher.



Dr. Wilfred Tysoe and Zhenjun Li discuss their research with UWM Foundation Board Director and Research Fellowship supporter Chris Fiasca.