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CEAS student presents cell culture research at MSGC Conference

About 14 WMU faculty members and students attended the 13th Annual Conference of the Michigan Space Grant Consortium (MSGC) held late last month in Ann Arbor. They joined delegations from the nine other Michigan universities that are part of MSGC.

Dr. Frank Severance, a professor in the Department of Electrical and Computer Engineering (ECE) and the director of WMU's MSGC program, said the conference provided an opportunity to review 23 research projects being sponsored by MSGC grants. He introduced seven of the 15-minute presentations.

Michael Ellinger, a master's student in electrical engineering, presented "Computing with Neuron Cell Cultures," based on his research in biological computation, which involves the acquisition and analysis of electrical signals from cell cultures using microelectrode arrays (MEAs).

According to Ellinger, MEAs are special tissue culture dishes embedded with electrodes that enable measurement and stimulation of cell culture electrical activity. Low-noise multi-channel electronic instrumentation is being developed, and specialized software is required to analyze and model system behavior. This is his first project involving cell cultures.

In order to examine the results of stimulating the cells, he first had to understand cell culture protocols and learn to work with cells in a sterile environment. To learn about the cells, he credited the assistance he received from **Sister John-Mary Vianney**, a graduate student from WMU's Department of Biological Services (BIOS), which is collaborating with ECE on the project.

Work on the project takes place at the Parkview Campus in the Neurobiology Engineering Laboratory. The project advisers are **Dr. Brad Bazuin**, **Dr. John Gesink**, **Dr. Damon Miller**, and **Dr. Frank Severance**, ECE professors, and **Dr. John Jellies** and **Dr. John Spitsbergen**, BIOS professors.

Ellinger, whose research was supported in part by a MSGC grant and in part by a WMU FRACASF grant, plans to complete his master's thesis on the cell culture research by Summer 2009.



Among those attending the MSGC conference from WMU were (front, from left): **Mike Ellinger**, **Hanyi Dai**, and **Sister John-Mary Vianney**; (back, from left): **Dr. Frank Severance**, **Kyle Batzer**, **Dr. John Gesink**, **Dr. Damon Miller**, **Chad Albert**, and **Vincent Krauss**

A poster on a cell-culture companion project – "Low Noise Instrumentation for Amplification of Electrode Voltages in Neuron Cell Cultures" by **John Stahl** and **Eric Jones**, master's and bachelor's students in electrical engineering respectively, was also displayed at the conference.

Hanyi Dai, a Ph.D. student in electrical engineering who earned her master's at WMU, presented a poster display. "Adaptive Control Algorithm in Heterogeneous Swarm Robotic Systems" showcased her work on the coordination of a large group of simple robots that worked together effectively and efficiently to complete a task. "The idea for this project comes from the biological swarming of black ants and of bees," she said. "They always work together and they do it without obvious controls."

As a Chinese citizen, Dai does not qualify for a MSGC grant, but she said she brought the project to the conference to share with others. "This research is very exciting," she said. **Severance** is Dai's Ph.D. adviser.

Severance wants more students to become involved in seeking MSGC grant opportunities. "This is a relatively easy process to get research funds, and it's available to students," he said. The next deadline is Nov. 26, 2008. For more information see www.umich.edu/~msgc or email Severance at frank.severance@wmich.edu