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**ARIM: Automotive Research and Industrial Mentorship  
REU Program at Oakland University**

**Dept. of Mechanical Engineering**



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**Final Project Presentations**

Wednesday, July 30, 2008  
187 Science and Engineering Building

9:30AM – 10:00AM: **Nanofluids:**

Presenters: Joseph Betcher - Lake Superior State University  
Kelsey Hulea – Youngstown State University  
Advisors: Dr. Chris Kobus and Dr. Brian Sangeorzan

10:00AM – 10:30AM: **Investigation of Flow through Intake Valves**

Presenters: Michael Capehart - Baylor University  
Diana Chicuri - Florida International University  
Rachel Howell - Valparaiso University  
Michael Tobin - University of Rhode Island

Advisors: Dr. Brian Sangeorzan, Dr. Alex Alkidas and Dr. Laila Guessous

The placement of the valve is crucial for optimal air flow into the cylinder. As the valve diameter increases and the valve-to-cylinder wall distance decreases, a phenomenon, known as the Blocking Effect, begins to interfere with the flow of air. Therefore, through CFD simulations and experimental data from a flowmeter, we investigated the optimal position of the intake valve in relation to the cylinder wall.

10:30AM – 11:00AM: **Investigation of Flow Channel Design on Bipolar Plates**

Presenters: Jason Kloess - University of Michigan  
Joan Liu - Franklin W. Olin College of Engineering

Advisors: Dr. Xia Wang

Fuel cells are a way to convert chemical energy into electrical energy. Flow channel design influences the performance of a fuel cell, each with some advantages and disadvantages. During this research project, new flow channel designs were suggested and investigated using computational and experimental methods. Results and suggestions for future research are discussed in this presentation.

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**About ARIM:** The ARIM Research Experience for Undergraduates (REU) program was setup in the department of mechanical engineering to provide meaningful, hands-on, paid 10-week summer research experiences to eight talented and motivated undergraduate engineering students from across the United States. This program is sponsored by the National Science Foundation and by the Department of Defense



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ASSURE program and was funded for the 2006-2008 summer periods. Students work in teams on automotive research projects involving fluid mechanics, heat transfer, energy and/or tribology. It is hoped that such a program will engage participants in rewarding research experiences that excite and motivate them to pursue careers in scientific and engineering research. In addition to working on research projects, students take part in other activities such as industrial research lab and facilities tours, meetings with working engineers, conferences and seminars. For more information about the program, please visit <http://me-reu.secs.oakland.edu>



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