PHOTO BY ERIN GROOM / INSTRUCTIONAL MEDIA CENTER

MSU ON THE ROAD TO SUCCESS with THERMOELECTRIC RESEARCH

>> Jane L. DePriest

Hot Press Improves Ability to Produce Thermoelectric Devices

A 100-ton giant is now in operation on the MSU campus. It is a hot press, and it is the centerpiece of the equipment being used for thermoelectric research at MSU. This hot press, manufactured by **Thermal Technology, LLC**, is being used for large-scale processing of semiconductor materials to improve their properties for use in thermoelectric devices. The press can achieve 2200°C in a vacuum or inert gas atmosphere. The main heating element is a graphite cylinder measuring approximately 14 inches in diameter by 20 inches tall. The hot press has automatic, programmable controls for temperature and force that can be used simultaneously or independently.

This press, which cost more than $500,000 with an equal amount in infrastructure costs, arrived on campus in January 2007. The initial hot press run was March 7, 2007. "Our group put forth a huge effort to get the funding for this piece of equipment," says Harold Schock, one of the primary investigators on MSU thermoelectric projects. The hot press is key to making materials with consistent thermoelectric and mechanical properties so that when used in devices they will work the same each time used. MSU is one of only a handful of organizations, including universities and other research centers, with a hot press of this size for research applications.

The hot press is part of the Automotive Research Experiment Station, now housed within the new $10 million Energy & Automotive Research Laboratories, located on campus at the Engineering Research Complex–South. The grand opening for this 29,000-square-foot, state-of-the-art research facility was in August. The new facility focuses on research to improve automobile engine efficiency, reduce vehicle emissions, and seek alternative energy sources.