

Missouri S&T Materials Day

This year Missouri S&T Material Advantage members organized and facilitated 'Materials Day' on April 16, 2010 thanks to a grant funded through ASM International. This day of demonstrations was designed to get junior high and high school students interested in materials engineering. Nearly 90 high school students from the nearby Rolla area attended the event. These students were in attendance from 3 schools from Salem, MO; Dixon MO, and Crawford, MO.

The day started with an address from the Missouri S&T Material Science and Engineering (MSE) department chairmen, Dr. Wayne Huebner, who discussed the importance of materials in today's society and gave examples of research happening at the university and the world.

The students were split into 5 groups and were taken to demonstrations including:

- 1) **Material Research Center**
The students were shown different coating techniques such as sputtering and spin deposition. We were able to sputter platinum onto pennies which the kids were able to take home with them. The students were also shown the SEM labs and the capabilities of seeing microstructures through the microscope. These processes and techniques were explained and their importance to material science was discussed.
- 2) **Metal Foundry**
Missouri S&T is a school which has a fully functioning metal foundry where we can cast aluminum and bronze. The students were shown how to green sand cast metal shapes from Styrofoam preforms and select students were able to help pour the metal themselves.
- 3) **Ultra High Temperature Ceramics Lab**
The graduate students in the Ultra High Temperature Ceramics research group helped in the day by demonstrating the materials they research. An oxyacetylene torch was used to heat up ceramics to 2100C+ and show the kids the high melting temperature and oxidation resistance of the ceramic materials. Also, a demo on thermal shock of alumina was performed. Outside of their research area but still intering the graduate students set up a thermoelectrics demo where two materials were attached then heated. The voltage was measured showing the thermoelectric effect.
- 4) **Misc Demos in Undergraduate Lab**
Miscilanious demos were done in our undergraduate lab. These demos include pouring glass, explaining about materials used in lasers as gain mediums, properties of polymers, semiconductors, superconductors, tempered glass, shape memory alloys, and more.
- 5) **Glassblowing**
To appease the more artistic students but keep it scientific we showed the students our Glassblowing facilities on campus. To keep scientific content up we had discussions on viscosity, forming techniques in industry, origins of color(in glass and in general), glass transition, annealing and how thermal gradients lead to stresses, and refractory materials.



Lunch was provided via the grant from ASM international and Dr. Kosher, the professor in charge of ASM materials camp, was able to talk to the students about returning for the universities' summer camp. Teachers from the schools reported back students making comments such as "I am SO going to college" from students were not keen on the idea beforehand and hearing remarks from students about how chemistry and physics really were related, how they didn't know it applied to so much, and how they are now much more interested in the field of physics, chemistry, and materials.

Group picture at the end of Materials Day.