



## UMC Meets at ASM/TMS Fall Meeting in Columbus Ohio

The Fall meeting of the UMC was held October 6, 1996 at the Regal Hotel in conjunction with the Fall ASM/TMS meeting in Columbus, Ohio. It was chaired by Dick Tressler.

## Introducing Materials Science in K-12

We discussed introducing materials science and engineering to secondary school teachers as a recruiting strategy to increase enrollment in university materials science and engineering programs. Tom Stoebe cited examples from the University of Washington experience of bringing materials science into secondary, middle and even elementary schools. This included: breaking Correlle plates, heating space shuttle tiles, which he said are readily available from NASA, demonstrating the cry of tin, playing with liquid nitrogen, bending paper clips, and shrinking shrink-fit plastics. He mentioned programs around the country such as those at Pacific Northwest Laboratories, Norfolk State University, Northwestern, and the University of Illinois that are working to acquaint high school teachers with materials science.

Karen Wieda from the Pacific Northwest National Laboratory (PNNL) Program for Teachers told us of the successes they have had with their two week summer program at PNNL. Here they immerse high school teachers and administrators in materials science and technology. The program covers metals, ceramics, polymers, and composites. Working with researchers, technicians, and mentor teachers, the teachers enhance their knowledge of the nature and behavior of material, conduct experiments, integrate writing and sketching in a journal to record observations; and explore creativity, innovation, and scientific inquiry in the workplace. In the past the Department of

Energy has funded the Summer Teacher Development program. This year the DOE funding was cut for all pre-college programs at the national laboratories. PNNL is considering charging a fee for the two week teacher institute and has received positive feedback from districts concerning a fee based program. She also mentioned that it costs about \$40K to implement a materials science and technology class in a high school. Much of the up-front cost is to for the purchase of furnaces, casting machines and other equipment for the laboratory. She said they encourage a district team come to the summer program. Such a team would include a high school science teacher, high school technology teacher, and an administrator, or counselor. Having a team from the district helps insure the support needed to implement the materials science and technology program.

## Recruiting Students

Jim Economy from the University of Illinois talked about approaches they are using to recruit students. He pointed out there are many students who come to the university thinking they are going to become engineers. After the first year 40% change their major to other engineering disciplines or leave the field completely. These students who change majors represent a potential untapped resource for recruiting students into Materials Science and Engineering.

He listed six things the department at the University of Illinois have done to recruit students. These are: (1) educating high school teachers about materials science and engineering, (2) preparing teacher modules for high schools, (3) sending materials science seniors to talk to high school students, (4) sponsoring awards in high school science fairs, (5) inviting high school seniors with high ACT scores and their parents to open houses at the University of Illinois in October and November, and (6) awarding scholarships to incoming

freshmen. They have found that the last two, open houses for high school students and their parents and offering scholarships have been very successful. They have been doing this for several years now and he said that the caliber of the students in the department has increased. He cited data showing that the University of Illinois ACT scores in engineering are in the 29-30 range. In computer science and electrical engineering there are about 30, whereas in materials science and engineering there are now about 31, which is the highest in the college.

He mentioned that they gave out approximately 30 four year scholarships this past year ranging from \$500 to \$1,000. The total cost may approach \$60k per year for ongoing undergraduate scholarships. They solicit donations from alumni and industries to support these scholarships.

They find that by inviting the parents to visit the department the parents encourage the students to come to the department. They point out to the parents that the department does job placement for its graduating seniors, which impresses the parents.

Reza Abbaschian also talked about recruiting students. He said that the materials science department at Florida awards \$50, 100, and \$150 prizes for high school science fairs. He mentioned that they get about 50% of their class from freshmen and 50% from junior colleges and community colleges. He sees the junior colleges and community colleges as useful sources for students.

### **Washington - NSF/DMR**

Jim Economy talked about Washington and NSF/DMR. The 1997 NSF budget is projected to increase by about 2% for 1997 and the DMR budget will increase by about 5%. The academic infrastructure program is going to be eliminated. He said that if we have suggestions for a person to replace Bill Harris we should tell Dick Tressler who can make a suggestion to NSF on behalf of UMC.

### **Federation of Materials Societies**

Dave Williams from Lehigh gave a report on a recent Federation of Materials Societies (FMS) meeting. The UMC is an affiliate member of FMS. However, UMC is not well known in FMS, as they list us as the University

Research Council rather than the University Materials Council. Dave pointed out that UMC is the only member of FMS that represents materials education. He is willing to continue as the UMC representative to FMS.

### **National Materials Advisory Board**

Reza Abbaschian reported on the activities of the National Materials Advisory Board (NMAB). NMAB has recently completed various projects, such as "Coatings for High Temperature Structural Materials", "Workshop on Materials and Process Research and the Information Highway", "Improved Fire and Smoke Resistant Materials for Commercial Aircraft Interiors", "New Materials for Advanced Civil Aircrafts", and "Evaluation of Long-Term Aging of Aeronautical Materials and Structures Using Accelerated Test Methods". These projects were sponsored by AFOSR, FAA, NASA, and agencies. NMAB is also putting reports together for the recently completed studies in "Advanced Materials and Fabrication Methods for Microelectromechanical Systems" (MEMS), "Intermetallic Alloy Development", "Commercial Aviation Security", and "Nonconventional Concrete Technology for Renewal of the Infrastructure".

Among other active studies, he reported on the upcoming workshops on "Research Opportunities for Metals in Aero-Turbine Engines: Meeting Users Needs", and "Advanced Fibers for High-Temperature Ceramic Composites". He finally reported on the new study on "Materials Science and Engineering: Forging Stronger Links to Users". This study which will start soon, will build on the previous MSE study, and will be chaired by Dale Stein. It is anticipated that the study will be done in a year or so. There was some discussion about the type of report that should be done.

### **ABET**

Jerry Liedl reported that ABET meetings were being held at the ASM/TMS meeting while the UMC meeting was in progress. He emphasized again that departments are going to have to set their teaching objectives and the departments will be evaluated on how well they have achieved their objectives. The ABET Board gave final approval to ABET Engineering Criteria 2000 at its meeting in November. Proposed program criteria for the materials area are listed on the TMS WWW

site under education (<http://www.tms.org>) and full ABET information is available via their site (<http://www.abet.ba.md.us/>). The proposed program criteria will be reviewed by the EAC of ABET at their July 1997 meeting. Two universities will be visited in fall 1997 under the new criteria to gain experience on implementation. The new criteria will have a phase-in for visits in 1998 through 2001 and you will have a choice of the two criteria. TMS will develop guidelines for the evaluators and institutions during the next year to assist in the implementation. Sessions will be planned to make all parties aware of the new process.

### **Career Resource Center**

Jerry Liedl reported that the Sloan Foundation funded Career Resource Center for the field is progressing. A temporary (4 page black and white abbreviated) career booklet is available at TMS while a new one is being prepared. The WWW temporary site (available through TMS site) is up and running as an experimental base. A career path focus survey of graduates is in progress with results of a trial survey finished last June available at the WWW site. An "Ask the Expert" forum is available on the WWW site. Progress is being made toward generating the CD ROM and video interviews with the signing of a contract with a commercial firm, Ruder-Finn, to complete those tasks.

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### **Moment of Silence in Remembrance of Frank Worzala**

There was a minute of silence in remembrance of Frank Worzala from Wisconsin. He retired in July and died unexpectedly of a heart attack while out jogging in August. Frank's outgoing personality, enthusiasm, and love of materials science will be missed by all of us.

Frank's family, colleagues, and friends will remember him for many things, but most of all for his unquenchable optimism and enthusiasm. He taught us all to love life.

Frank will be especially missed by his loving family. He is survived by his wife Diane, 9 children, and 7 grandchildren.

Frank's children bought a bench in memory of their dad. It is located by the swimming dock at the Memorial Union Terrace. Frank always

enjoyed going to the Terrace to drink a cappuccino or a beer in the evening. When you are on campus, spend a few minutes on Frank's bench at the Madison Terrace.

### **Next Meeting**

The next meeting of the UMC is scheduled for May 15, 1997 at the Days Inn Crystal City in Arlington, VA (tel 800-325-2525 or 703-920-8600). We have rooms reserved for the night of May 14, 1997. The meeting will start at 8:30 am on May 15, 1997.