Chair’s Corner
Dear Alumni, Colleagues and Friends,

Greetings from Rolla! After a 6 year hiatus from the department as the Vice Provost for Research I’ve come back to be Chairman again. It’s wonderful to be back – I didn’t realize just how much I missed the students, staff and faculty of MSE until I stepped back into the classroom.

What a relief it was to know that on a daily basis I could have a positive influence on the lives of our future alumni! Of course the students may beg to differ, but I’m happy. Richard Brow did a simply marvelous job as chairman from 2000-2006, turning around our enrollment decline, merging Metallurgy & Ceramics into arguably the best department on campus, and raising the overall research productivity. Hats off to Dick for his hard work and inspiring leadership!

This newsletter provides in detail all the important issues that affect student success, our #1 priority. Every measure we gauge ourselves on is on the increase, including enrollment, scholarships awarded, placement, average starting salaries, research productivity, student awards and recognitions, and faculty awards and recognitions. This is a direct result of the quality of our students, staff and faculty. I won’t be redundant here and summarize all the great things going on; I hope you’ll take the time to read about all of them. And you need to know that none of them would have been possible without the strong support of our alumni. All of us thank you profusely for your dedication to your alma mater. On many occasions this year we’ve hosted seminar speakers from industry and academia – the day often ends with a comment of “I can’t believe how well your faculty get along, they actually seem to like working together!” We have a unique department compared to all of our peers – the MSE department has maintained its long tradition of the pursuit of excellence, and has done so without ever sacrificing our commitment to the students.

This newsletter contains a survey that I hope you’ll take the time to answer. Your answers will play a major role in determining what courses will be added, modified or eliminated. In the year 2008 we will be reviewed by the Accreditation Board for Engineering Training (ABET). Important to this process is information from our alumni regarding the value of their education,

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Zuch Wins MODERN CASTING Scholarship

Jeff Zuch (c) won the 2006 MODERN CASTING Scholarship, awarded to him by publisher Rolf Petersen (l) at December's FEF Conference. Also pictured is Von Richards, Key Professor at the University of Missouri-Rolla.

Meghan McGrath Copper Club Recipient $5,000

KUENY SELECTED TO ACADEMIC ALL-AMERICA TRACK TEAM

University of Missouri-Rolla senior Becca Kueny, a two-time conference champion in the javelin throw, is now a two-time ESPN The Magazine Academic All-America selection.

Kueny was named to the team that was released today as a first team selection for the 2006-07 season. The award comes on the heels of a second straight appearance at the NCAA Division II Championships where she finished ninth in the javelin, the event in which she repeated as the Great Lakes Valley Conference champion just a month earlier.

A ceramic engineering major who was also the recipient of the women's Gale Bullman Award following the 2006-07 athletic season, Kueny earned All-America honors in the javelin in 2006 after posting the second-best throw in the event in school history of 148-6.

In addition, Kueny placed seventh in the discus throw at the conference meet this season to help lead the Lady Miners to a fourth place finish in the meet. She is also a member of the GLVC All-Academic team for the 2006-07 season and has earned four academic all-district awards, two in track and field and two more as a member of the women's basketball team.

Effective January 1, 2008, the University of Missouri-Rolla is changing its name to Missouri University of Science and Technology (Missouri S&T for short). The new website for the Materials Science & Engineering Department will be http://mse.mst.edu.
Kueny is the fifth UMR student-athlete to earn ESPN. The Magazine Academic All-America honors during the 2006-07 school year. She joins Dan Gravlin (men's soccer), Kandi Wieberg (women's soccer), Bill Gaul and Andy Shelley (swimming) as recipients of the award. UMR has had 47 Academic All-America awards given to its student-athletes throughout its history including 24 since 2000, the fifth-highest total among NCAA Division II institutions.

AIST SCHOLARSHIPS

Great News! Six metallurgical engineering students received AIST Foundation scholarships for this fall that will provide them $5,000 for their junior year, an internship between their junior and senior year, and $5,000 for their senior year. That’s a total of $60,000 from the AIST Foundation to our students.

The six students that received scholarships include: Lauren Rose, Wes Everhart, Josh Noll, Wesley Croom, Steve Webb and Matt Meyer.

WAAIME SCHOLARSHIP RECIPIENTS IN CERAMIC & METALLURGICAL ENGINEERING FOR 2007/08

Every year the Woman’s Auxiliary to the American Institute of Mining, Metallurgical and Petroleum Engineers (WAAIME) awards many scholarships to our students:

- Laura Bartlett - $4,000 - Metallurgy
- Andrew Binz - $2,000 - Metallurgy
- Ryan Eller - $3,000 - Metallurgy
- Leah Glauber - $3,000 - Ceramic
- Lucas Judlowe - $4,000 – Ceramic

WAAIME – The Woman’s Auxiliary to the American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc.

Hats off to the MSE faculty wives who dedicate many hours interviewing students, and promoting them to receive these scholarships: Ruth Robertson, President, Laura O’Keefe, Dottye Wolf and Darlene Ramsay.

IDEA FOR GLASS BALLOONS GETS UMR GRADUATE STUDENT INTERNATIONAL RECOGNITION

Making a balloon out of glass might not seem like such a great idea on the surface – but Hank Rawlins, a graduate student in metallurgical engineering at the University of Missouri-Rolla, thinks glass balloons might turn out to be the best way to put monitoring equipment in the upper atmosphere.

Rawlins, from Farmington, MO, recently took third place in the 2007 Strength in Glass Contest, a year-long challenge for university students interested in identifying marketable new products, engineering opportunities and cost savings that would be possible “if glass of any type were available at 50 times its current strength.”

Rawlins received $5,000 for his proposal of “Eversphere Glass Balloons.” The concept involves high-strength, thin-walled vacuum glass balloons. The balloons would have a greater lifting force than helium or hydrogen balloons and would allow scientists to permanently place monitoring equipment in the upper atmosphere.

Armin Dellert, a student at Friedrich Alexander University in Erlangen, Germany, placed first in the contest. Dellert’s paper envisioned solar cells on a flexible thin glass substrate that could be rolled up into spools and spread out when needed. Dellert was awarded $20,000 during the International Congress on Glass, which was held in July in Strasbourg, France.

Julieann Heffernan of the New Mexico Institute of Mining and Technology placed second and received $10,000. Heffernan proposed a glass panel roofing system that would support heavy loads of snow and withstand the impact of large hailstones.

The competition was sponsored by the Glass Manufacturing Industry Council (GMIC), the glass and optical materials division of the American Ceramic Society, the International Commission on Glass, the Center for Glass Research and the National Science Foundation’s International Materials Institute on New Functionalities in Glasses.

“Well the industry now has a clear look at some of the amazing products that will be possible when the barriers to stronger glass are overcome and the target strengths are achieved,” says Michael Greenman, executive director of GMIC. “The next step of this process will be the creation and announcement of an X-Prize in Glass.”

The X-Prize in Glass would be similar to the $10,000,000 Ansari Prize, which was offered in 2005 to encourage privately funded space flight.
WHERE ARE THEY??

John L. Watson, Ph.D., Dean of the School of Engineering and Mines, Professor of Mechanical Engineering

After 20 years on the faculty of metallurgical engineering, John Watson left UMR in 2001 to become Dean of the School of Engineering and Mines at the University of North Dakota in Grand Forks. The move provided John with the opportunity to be involved with campus administration, state-wide engineering activities, the Engineering Deans Council, and research and development projects including directed funding projects. Significant progress has been made in the School with enrollment, particularly at the graduate level, and in terms of research grants and contracts which have more than quadrupled. Major achievements have been the initiation of an Engineered Surfaces Center through a DOD contract, and the enhancement of the Distance Engineering Degree Program, which now has over 300 students and is the only undergraduate engineering accredited program in the U.S.

In addition to the professional opportunities, the move provided John and Ann with exposure to the unique climate and culture of the Upper Great Plains. In Australia they experienced +40 C, and ND provided -40 C!!! As part of the campus development program, John and Ann have traveled a great deal and met numerous alumni, many of whom have had hugely successful careers. One condition of moving to ND was a commitment to spend each spring break in the sun, and they have visited five Mexican resorts during their time in ND. Other travels have included Norway, the Baltic, central Europe, China, Italy, and New Zealand. Through fortuitous circumstances, both their children, Louise and Layland, and their families, have lived in neighboring states, and thus they have been able to get together frequently.

At this point in time, John and Ann have decided to retire at the end of the year, and are planning a move to the Piedmont area of Georgia, where they plan to build a home, and hopefully to play golf and tennis, to sail, and to travel.

Manfred Wuttig

Manfred Wuttig is still living in the Washington, DC area and working full time at the University of Maryland. All, including his wife, Michiko and daughter, Anna, are doing well. Anna is a senior in high school and will have to decide whether to attend university or conservatory or both.

Harry Weart

Harry Weart left UMR and Rolla in 1993 after a 29-year stay, retiring to northern Wisconsin. By 1998 when he was widowed, he had gravitated into the lake-preservation efforts of the Wisconsin Lakes Association, and had a leadership role in the county branch where he lived. From that experience, he was attracted to the land-use planning in progress in his township. He led a group of citizens and elected officials to formulate an award-winning plan, which was adopted in 2001.

After two successive winters with ten feet of snow, he sought a less-demanding climate in Asheville, North Carolina. His continued interest in rowing led him to a technique clinic in Florida, where he met Ellie. They married in 2003 (in Venice, Italy), and now shuttle each year between homes in the two states. They travel often, both overseas and in the U.S. visiting their big combined family, strewn from Colorado to New York.

Donald R. Askeland, Met Professor
(08/1970-12/2000)

Don and Mary sold their home in Rolla and moved to Rochester, MA where they are building a new home. This relocation will place them closer to their families.

FACULTY NOTES AND HIGHLIGHTS

Richard Brow was elected in July 2007 to the ‘Coordinating Technical Committee’ that oversees the activities of the International Commission on Glass. He finished a three-year stint as one of the US representatives to the ICG.

FIVE 2007 STUDENT CHAPTER GRANTS AWARDED

In keeping with its mission “to excite young people in materials, science, and engineering careers,” the ASM Materials Education Foundation created the Student Chapter Grants program. The program encourages and supports outreach efforts to
attract and excite young minds in the field of science and engineering.

**Recipients of Student Chapter Grants for 2007:**
- Arizona State University, Tempe
- Northwestern University, Evanston, IL
- University of Missouri-Rolla
- University of Washington, Seattle
- Washington State University, Pullman

**Way to go UMR!**

**UMR professor co-authors engineering textbook**

John Wiley and Sons recently published the 10th edition of “Materials and Processes in Manufacturing.” One of the textbook’s co-authors is Dr. Ronald Kohser, a professor of metallurgical engineering at the University of Missouri-Rolla. This marks the 50th anniversary of “Materials and Processes in Manufacturing.”

The original text was produced by Dr. Paul DeGarmo, a professor at the University of California-Berkeley, in 1957. Kohser became a contributing author during the writing of the fifth edition and has been a full co-author since the publication of the sixth edition.

The various editions of the book have been used at colleges and universities for the past 50 years. Students at UMR use the text for core courses in mechanical and metallurgical engineering.

“DeGarmo wanted to produce a text that would help engineers understand how the things they designed could be made,” Kohser says. “Manufacturing has been described as ‘the activities performed to convert stuff into things.’ The book begins by considering the stuff.”

A survey of engineering materials and information on matching performance properties to usage requirements is included in the opening of the book. Subsequent chapters present various manufacturing processes, including casting, forming, powder metallurgy, material removal and joining. Additional chapters cover heat treatment, surface engineering, quality control and process automation.

Kohser and J.T. Black, emeritus professor of industrial engineering at Auburn University, are the co-authors of the 10th edition of “Materials and Processes in Manufacturing.”

**Kisslinger makes $1 million estate pledge to UMR**

Dr. Fred Kisslinger, former professor of metallurgical engineering at the University of Missouri-Rolla, has pledged $1 million from his estate to UMR. The gift will help support UMR’s materials science and engineering department and the UMR athletic department.

Kisslinger specialized in teaching courses on the heat treatment of steel. He retired from the university in 1990. Last year, his ongoing generosity was recognized by the dedication of the Fred Kisslinger Metallography Classroom in McNutt Hall.

Childhood polio left Kisslinger with a paralyzed leg, but that didn’t prevent him from leading an active life. “I was swimming at the UMR pool back when it was still in Jackling Gym,” he says. “It was part of my physical therapy. When the multi-purpose building went up, I started swimming there up until a year or two back.”

As it became increasingly difficult for Kisslinger to get from the locker room to the pool, accommodations were made. “They have been very nice to me over at the athletic department,” Kisslinger says. “They let me use the dressing room off of the coaches’ offices. They also got one of these chairs that lift you in and out of the pool. I appreciated that.”

Kisslinger, who now lives at the Rolla Presbyterian Manor, earned a bachelor’s degree at UMR (then the Missouri School of Mines and Metallurgy) in 1942. He then attended the University of Cincinnati, where he earned a master’s degree in 1945 and a Ph.D. in 1947.

Kisslinger was on the faculty at the Illinois Institute of Technology from 1947 to 1964. He came back to Rolla in 1964 to join the UMR faculty, and he’s been living in the Ozarks ever since. “For a while, I had a cabin on the Gasconade River,” he says. “We dunked worms, as it were, and caught a lot of pan fish.”

These days, Kisslinger follows UMR basketball and the St. Louis Cardinals. He also keeps track of his investments. His $1 million estate gift to UMR will eventually be added to his existing endowments for metallurgical engineering and athletics. “I felt like my education gave me the ability to be successful,” Kisslinger says. “I wanted to give something back.”

**Robert Schwartz named vice provost for academic affairs at UMR**

Dr. Robert W. Schwartz, professor and associate chair of materials science and engineering at the University of Missouri-Rolla, became vice provost of academic affairs for the university effective June 18.

The position was created as part of an administrative restructuring that eliminated the university’s four main academic units: the School of Engineering, School of Management and Information Systems, School of Materials, Energy and Earth Resources, and College of Arts and Sciences.

As vice provost for academic affairs, Schwartz will oversee several academic support functions currently provided by the deans’ offices. He will also coordinate new degree program development, promotion and tenure, new-faculty mentoring, program reviews, and budget management and strategic planning efforts.
“Dr. Schwartz will play a crucial role for our campus as we transition into a new administrative model,” says Dr. Warren K. Wray, UMR’s provost. “As we move to a zero-schools model, Dr. Schwartz will be responsible for handling many of the support activities previously provided by the academic deans and their staff.”

Schwartz will report to Wray. The new administrative structure will take effect July 1.

A member of the UMR faculty since 2002, Schwartz received his Ph.D. in ceramic engineering from the University of Illinois at Urbana-Champaign in 1989. He also holds a bachelor’s degree in science education and a master’s degree in chemistry from North Carolina State University.

Prior to joining UMR, Schwartz was a member of the ceramic engineering faculty at Clemson University, where he was assistant professor from 1997-2000 and associate professor from 2000-2002. Previously, he was an advanced research and development engineer for B.F. Goodrich from 1980-1984 and, upon completion of his Ph.D., a senior member of the technical staff for Sandia National Laboratories’ Electronic Ceramics Department.

At UMR, Schwartz served as president of the Academic Council from September 2005 to September 2006. He also served as president-elect, secretary and parliamentarian of the Academic Council and currently chairs the Academic Council’s Rules, Procedure and Agenda Committee. Schwartz also served as UMR’s representative to the University of Missouri’s Intercampus Faculty Council from August 2004 to August 2007.

Recognized for his teaching excellence, Schwartz received UMR’s Faculty Excellence Award in 2004 and 2006, the Dean’s Award for Sustained Teaching Excellence in 2004 and 2005, and the Ceramic Engineering Outstanding Professor Award in 2004.

A member of the American Ceramic Society (ACerS), Schwartz was named an ACerS fellow in 2006. His other professional memberships include the Materials Research Society, the Institute of Electrical and Electronics Engineers, the American Society of Engineering Educators and the American Association for the Advancement of Science.

Schwartz’s technical interests include the design of high-performance actuator devices, dielectric and ferroelectric materials, ceramic thin films and functional materials.

**Academy of Mines and Metallurgy at UMR inducts new members**

Four University of Missouri-Rolla graduates were inducted to the UMR Academy of Mines and Metallurgy during a ceremony April 19 on the UMR campus.

Those inducted were Delores Hinkle, James Michael Party, Virgil Powell and Dr. Christopher Ramsay.

The academy, founded in 1995, is an advisory group to the UMR School of Materials, Energy and Earth Resources. Members include alumni and others who have made outstanding contributions to their profession.

Hinkle, of Houston, earned a bachelor’s degree in petroleum engineering from UMR in 1975. She is currently director of corporate reserves for Marathon Oil.

Party, of Midland, TX, earned a bachelor’s degree in geology and geophysics from UMR in 1978. He is currently the exploration manager for Wagner and Brown Ltd.

Powell, of Edmond, OK., earned a bachelor’s degree from UMR in 1955 and a master’s degree in petroleum and natural gas engineering from Pennsylvania State University in 1960. He is the owner of Sentinel Resources, an oil and gas company in Oklahoma City.

Ramsay earned bachelor’s and master’s degrees in metallurgical engineering from UMR in 1983 and 1985, respectively. He earned a Ph.D. from the Colorado School of Mines in 1990. Ramsay is currently an associate professor of metallurgical engineering at UMR and principal engineer of Ramsay Scientific in Rolla.

**Peaslee named UMR’s first Iverson Chair of Steelmaking Technology**

Dr. Kent Peaslee, Curators’ Teaching Professor of metallurgical engineering at the University of Missouri-Rolla, has been named the F. Kenneth Iverson Chair of Steelmaking Technology at UMR.

The chair was established in 2006 through a $2 million endowment from Nucor Corp., the largest steel company in the United States. The UMR chair was named in honor of Nucor’s founding chairman, F. Kenneth Iverson.

Nucor’s endowment will be used to enhance metallurgical engineering education and research. Support for undergraduate, graduate and post-doctoral students working with Peaslee in steel manufacturing is included.

“We conducted a national search for this chair and we found the best qualified person was already here at UMR,” says UMR Provost Warren K. (Kent) Wray.

Peaslee, who is also the associate chair of undergraduate studies in the UMR materials science and engineering department, joined the UMR faculty as an assistant professor in 1994. He was promoted to associate professor in 2000, professor in 2005, and named a Curators’ Teaching Professor in 2006.

Peaslee has received seven UMR Faculty Excellence Awards, 10 Outstanding Teaching Awards, the Class of 1942 Excellence in Teaching Award from the MSM-UMR Alumni Association and the Deans Teaching Scholar Award.

Peaslee is a manufacturing and process metallurgist with research interests in waste and metals recycling, steelmaking, continuous casting, foundry optimization, metal-refractory interactions and environmental aspects of metal manufacturing.

After earning a bachelor’s degree in metallurgical engineering from the Colorado School of Mines in 1978, Peaslee worked for 13 years in a variety of technical and management positions for steel companies, including Bayou Steel in La Place, LA; Border Steel Mills in El Paso, TX; Raritan River Steel in Perth Amboy, NJ; and CF&I Steel in Pueblo, CO.

Peaslee later attended graduate school at UMR, where he earned a Ph.D. in metallurgical engineering in 1994. He has published more than 85 papers in technical journals and conference proceedings.

Peaslee is a member of the Association of Iron and Steel Technology, American Society of Engineering Educators, American Foundry Society, Sigma Xi, Tau Beta Pi and Kappa Mu Epsilon.
UMR faculty members receive excellence awards

Twenty-one University of Missouri-Rolla faculty members received Faculty Excellence Awards from UMR Chancellor John F. Carney III during a dinner Dec. 18.

The awards are given annually to recognize teaching, research and service excellence. Each award winner receives a $2,500 stipend funded by industry and alumni contributions.

The 2006 Ceramic and Metallurgy faculty:
- Dr. Fatih Dogan, professor of materials science and engineering
- Dr. James Drewniak, Curators’ Professor of electrical and computer engineering, and MSE
- Dr. William Fahrenholtz, associate professor of materials science and engineering
- Dr. Greg Hilmas, associate professor of materials science and engineering
- Dr. Rajiv Mishra, professor of materials science and engineering
- Dr. Matthew O’Keefe, professor of materials science and engineering
- Dr. Robert Schwartz, professor of materials science and engineering

UMR established the award in 2004 to honor faculty members for their ability to create and maintain an outstanding learning environment for students. The award is designed to promote and encourage excellence across campus.

The following faculty members were selected for the awards:
- Dr. David Van Aken, professor of materials science and engineering
- Dr. Ron Bieniek, associate professor of physics and director of the office of undergraduate studies
- Dr. Jeff Cawlfield, professor of geological sciences and engineering and director of the freshman engineering program
- Dr. Xiaoping Du, assistant professor of mechanical and aerospace engineering
- Dr. Ralph Flori, associate professor of interdisciplinary engineering and associate dean of engineering for pre-college and undergraduate affairs
- Dr. Richard Hall, professor of information science and technology
- Dr. Michael Nelson, assistant professor of psychology
- Dr. Tim Philpot, associate professor of interdisciplinary engineering.

UMR faculty members receive teaching awards

Eight University of Missouri-Rolla faculty members received Deans Teaching Scholar Awards from UMR Chancellor John F. Carney III on Feb. 1.

The awards are given annually to recognize teaching, research and service excellence. Each award winner receives a $2,500 stipend funded by industry and alumni contributions.

Deming is the first voice you will hear when calling. Becka and her husband, Josh, will celebrate their second wedding anniversary in December. It's a disappointment to the students when they find out she is married. Becka graduated from Southeast MO State University (Cape Girardeau, MO) with a B.S. in Business Administration. Becka performs a WIDE range of duties that make the office run like a well-oiled machine.

Our forever Administrative Assistant, Joyce Erkiletian, handles the administrative work for the Undergraduate Program and also spends 1/4 of her time working for the Friction Stir Processing Cooperative Research Center-FSP/IUCRC with Dr. Rajiv Mishra. If you need information about courses offered, scholarships, job placement, just to mention a few, then she is the person.

Joyce’s legacy of over 30 years of dedicated service to the students and faculty of UMR was recognized in June by her receiving a Staff Excellence Award. And June 1st marked her 25th anniversary of serving in the Metallurgical Engineering department. Can you imagine a more appropriate time to recognize her? As the students and alumni know, Joyce is always quick to aid anyone whatever his or her need, independent of whether or not she has the time. She is never impatient with even the most trying requests, and always performs her duties with a smile. And in her office you will find a picture on
her file cabinet that is of the staff who originally founded the Staff Council. She is there, along with many other recognizable faces at UMR. One can define dedication as being a person’s achievement of excellence and its continuation over a sustained period of time. Joyce epitomizes what that means. Our hats off to Joyce!

Our Graduate Program is supported by long-time Administrative Assistant, Denise Eddings. Denise also works closely with the Research Projects and monitors the general operation funds. If you attend the MST meeting in October, you will see her there. Last year Denise received a UMR Staff Excellence Award. Congratulations!

Invoices must be paid and Chief Clerk, Craig Reay, is our go-to person. We probably have one of the largest credit card reconciliations on campus due to our high volume of research. Equipment must be bid and inventories maintained.

Our invaluable Editorial Assistant, Mary Lee, is the person who has organized this newsletter. Mary also works with Dr. Jeff Smith putting together the “Refractories Applications & News” quarterly magazine. GREAT job!

Our support staff is the best! They work very closely with our students and were given the highest praise during senior student assessment. Want to say “hello”? Email or drop them a note: eddings@umr.edu; erkilet@umr.edu; leem@umr.edu; hesterrh@umr.edu.

Thirty-five high school students spent the week of July 22-28 on the UMR campus learning about the career opportunities in metallurgical and ceramic engineering. This summer, ASM International continued its sponsorship of a residential student materials camp here at UMR. The students, who will be entering either their junior or senior years of high school, came from Arkansas, Colorado, Florida, Illinois, Iowa, Kansas, Kentucky, Maryland, Missouri, Ohio, Tennessee, and Texas.

During their stay, they heard presentations on: Materials Engineering as a Career Field (Dr. Kohser), Forensic Metallurgy (Dr. Ramsay), Recycling (Dr. Schlesinger), High-Temperature Materials (Melissa Teague), Engineering Ethics (Dr. Kohser), and Polymeric Materials (Dr. Schuman from the Chemistry Dept.). During the morning hours, the students broke into small groups and conducted projects under the guidance of department faculty, grad students, and undergrads. Project areas included: Evaporative pattern metal casting, Glass processing (effect of composition and additives), Piezoelectric ceramics, Friction-stir welding, Steel armor (complete with firing range testing!), Solid state electronics for controls, Use of an electron microscope to investigate laptop computer components, Lead-free solder vs. lead solder, Mud-lab ceramic products, and Reaction kinetics using mentos and diet coke. The afternoon hours began with a brief instructional class, followed by tours and demonstrations at the High Temperature Materials Lab, Friction Stir Processing Lab, Foundry, Electron Microscopy Laboratory, Mechanical Testing Laboratory, Ceramic Processing Lab, and the

UMR STUDENTS WIN TOP STEEL INDUSTRY SCHOLARSHIPS AND AWARDS

This summer, students from UMR were the winners of nine international scholarships worth a combined $66,000 from the Association for Iron and Steel Technology (AIST). AIST awards approximately 30 international scholarships each year. This year there were only four universities with multiple scholarship winners, Notre Dame University with two, McMaster University (Canada) with two, University of Alberta (Canada) with two, and UMR with nine scholarships. The nine scholarship winners are: Lauren Rose, Wesley Everhart, Joshua Noll, Wes Croom, Stephen Webb, Matthew Meyer, Micah Morrison, Ryan Dusheke, and Hillary Griffith.

Students from UMR along with engineering students from several other universities attended AISTech in Indianapolis, May 2007, where they presented papers and competed for a number of awards. UMR won the $500 Attendance Challenge for the university with most students in attendance at AISTech. There were two senior design teams from UMR that competed in the first annual Project Presentation Contest at AISTech where nine student teams presented their senior design projects before a panel of judges. UMR’s team of Zane Voss and Ryan Spoering won third place and a $500 prize for their project, “Life Cycle Green House Gas Emission Comparison of Steel and Concrete Structural Members for Bridges.”
Field trip to Mo-Sci by ASM Materials Camp students.

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Glass Processing and Thin Films Laboratories of the Materials Research Center. The bulk of Wednesday was an all-day field trip to Pevely, Missouri (south of St. Louis). Our day began with a tour of the Carondelet Foundry operation of Metal-Tek Corporation, a producer of specialty metal castings. Department alumnus Barry Craig is the plant manager. This was followed by lunch at a city park (arranged by alumnus Kent Weisenstein of Missouri Refractories).

In the afternoon, we toured the St. Gobain glass operation where 6 million brown beer bottles are made every day for Anheuser-Busch. On Thursday afternoon, we again left campus and traveled to the Rolla industrial park, where we toured Mo-Sci Corporation (Dr. Day’s business), where the group was exposed to the high-tech aspects of glass microspheres used for a variety of medical and industrial applications. The accompanying photo shows the group at the Mo-Sci facility.

Thursday evening was a capstone activity, beginning with a presentation by Dr. Wayne Huebner highlighting the accomplishments of our materials engineering department and research activities at UMR. This was followed by our infamous “Walk-on-Water” contest. On Monday, the students were grouped into teams of 5-6 individuals and challenged to design and build “shoes” that would attach to their feet and allow a member of their group to “walk” across the university’s indoor swimming pool. They could spend up to $50 on their “shoes” which needed to address the features of buoyancy, stability and propulsion. Design commenced on Monday night, and materials requisition lists were submitted on Tuesday morning. The materials were delivered on Tuesday evening, and construction commenced. This year’s efforts were a little more demanding than previous with the banning of Styrofoam as a construction material. Unfortunately, none of our teams were successful in crossing the pool, but all had fun trying and learned a bit about engineering design and materials.

With this being the fourth year of Materials Camp, we are now seeing students who attended previous offerings in our freshman class. Moreover, they are already wanting to become involved in the research activities they learned about during their previous visit.

ASM requires that its Materials Camps are totally FREE to the students! Financial sponsorship for this summer’s program came from ASM International, Caterpillar Tractor, and two divisions of Nucor Steel. Co-directors were Dr. Ron Kohser and Dr. Mary Reidmeyer.

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PHOSPHATE GLASS RESEARCH

UMR has an international reputation as a center for research on the properties, structures and applications for phosphate glasses. This reputation is based in large part on the research done by Prof. Delbert Day and his students over the past twenty years to develop iron phosphate glasses as chemically-stable hosts for radioactive wastes and to formulate novel phosphate glasses for high expansion sealing applications, as well as his earlier work on mechanical relaxation in alkali phosphate glasses. More recently, that reputation has been enhanced by the work of Prof. Richard Brow and his students on a variety of basic and applied studies. Current projects include an NSF-funded study of the structures and optical properties of rare earth phosphate glasses. Nate Wyckoff (PhD candidate) has developed novel techniques to prepare these unusual glasses and we have collaborated with colleagues in North Dakota, Iowa, Germany, and Romania to characterize their structures and properties, with the goal of better understanding how rare earth ions affect the performances of optical devices. A second NSF-funded project is a collaboration between Prof. Mark Schlesinger and Richard Brow to characterize the stability of iron phosphate melts and glasses. Melodie Schmitt and Lily Zhang, both PhD candidates, are studying the crystallization
behavior, and the liquidus properties of the iron phosphate systems, respectively. With colleagues in Brazil and Argentina, we expect that this work will provide general information about the effects of processing conditions on the properties and structures of multivalent oxide glasses. Other projects include a collaboration with MoSci, Inc. to develop phosphate glass fibers for reinforcing cement composites, and smaller projects to investigate the potential for phosphate-based bio-glasses, for forming low-temperature phosphate optical glasses, and for designing novel phosphate sealing materials. A common theme for much of this work is to understand how phosphate glasses interact with aqueous environments. That understanding was greatly advanced by the research of several recent UMR graduate students, including Carol Click (CerE PhD, 2002, now at Schott Glass) and Brad Tischendorf (CerE PhD, 2005, now at Medtronic).

NEW PALMER NO-BAKE SYSTEM FOR THE UMR FOUNDRY

The Cast Metals Industrial Advisory Committee, headed by Doug Imrie (B.S. Met E yr?), owner of Southern Cast Products purchased and donated a new Palmer sand mixer with modern PLC’s and resin bypass design. This is set up to run two-part or three-part no-bake systems. This is a tremendous addition to the foundry as we have moved more toward no-bake systems in our teaching and away from oil sand for cores in the teaching labs. We have also moved extensively into use of no-bake systems in our steel casting research. A big thank you to Doug and the Cast Metals Industrial Advisory Committee Members. Also a thank you to Jack Palmer, owner of Palmer Manufacturing, who offered UMR a substantial discount as a match, personally delivered the unit, directed the install and gave the training to faculty and staff. Donors who contributed:

Companies:
Bodine Aluminum Southern Cast
MetalTek St. Louis Precision Casting
American Foundry Society Student Chapter -- UMR

Personal Contributors:
David Kroeter Dan AuBuchon
Brandon Kruse Steve Lane
Von Richards

AIR FORCE HAS HIGH HOPES FOR UMR RESEARCHERS - -UMR TEAM SELECTED TO DEVELOP REVOLUTIONARY TECHNOLOGY

The United States Air Force is looking to the University of Missouri-Rolla for a revolutionary way to power everything from unmanned aerial vehicles to terrestrial robots.

During a recent visit to Eglin Air Force Base in Florida, a UMR research team was informed that they have won the Air Force Research Laboratory Munitions Directorate (AFRL/MN) nationwide “Campus Challenge II” competition to develop ideas for such a technology. Last year, UMR learned it was one of two finalists chosen to prepare a technology roadmap for the AFRL/MN. The other finalist was the California Institute of Technology.

UMR’s development plan was judged to be the best in the competition, and now, with the official backing of the AFRL/MN, the UMR team will move ahead with plans for further research.

Dr. Fatih Dogan, a professor of materials science and engineering at UMR, is leading the Rolla-based effort. He says the Munitions Directorate, which is developing systems with electrical requirements that can exceed the capabilities of known power sources, is looking for a new source of compact power to replace conventional energy systems like batteries.

“The roadmap describes how to apply nano-scale science and engineering expertise along with lessons learned from Mother Nature to create revolutionary new approaches for the development of long-duration power systems with high energy capacity,” Dogan says.

Because of the military implications, a lot of the technical details aren’t available to the public. But Dogan says the new bio-inspired energy sources, which will be compact, lightweight and extremely long-lasting, are expected to be used to power unmanned aerial vehicles, autonomous terrestrial micro-robots, artificial intelligence systems and other military devices.

“With respect to developing highly efficient and compact power sources, we can learn lessons from nature,” Dogan says. “Some examples are the highly efficient flight muscles of birds or insects, or electric fish that can send pulses for navigation or for generating a strong shock to stun prey.”

As is the case with most military innovations that begin with a long-term vision, Dogan says the technology should eventually trickle down to the public for conventional usage in devices like laptop computers and cell phones.

The five UMR researchers involved are Dogan, Dr. Keith Corzine, associate professor of electrical and computer engineering; Dr. Melanie Mormile, associate professor of biological sciences; Dr. Matt O’Keefe, professor of materials science and engineering; and Dr. Jay Switzer, the Donald L. Castleman/Foundation for Chemical
Research Missouri Professor of Discovery in Chemistry. Dr. Mariesa Crow, dean of the UMR School of Materials, Energy and Earth Resources, accompanied them on the trip to Florida to receive the Air Force award.

The University of Missouri-Columbia, St. Louis University and Battelle are also lending some expertise to the UMR effort.

**FACULTY NOTES:**

In June of this year, Prof. Bob Schwartz moved to an administrative position at the University. He currently serves as Vice Provost for Academic Affairs. The duties of this office include providing administrative support to the academic departments, working on faculty recruiting, retention, and mentoring, approval of new degree programs, development of policies for faculty leave and non-tenure track faculty, and working with the University Advancement office and the academic departments to help further the mission of the university. Dr. Schwartz’s CER 102 class is now being taught by Dr. Mary Reidmeyer and CER 284 is being taught by Dr. Huebner. Dr. Huebner and Dr. Schwartz maintain collaborations on research projects on dielectric materials.

Professor Joe Newkirk has received several new research contracts. One, jointly with Dr. Frank Liu, is from the Air Force for laser deposition of a functionally gradient heat exchanger for space applications. This is the third contract Newkirk has received jointly with Dr. Liu in the area of rapid prototyping. Another, lead by Dr. Dave Summers, involves developing new waterjet nozzle designs and fabricating them for the demilitarization of large munitions. Dr. Newkirk was also awarded a second year for his DOE-NERI project, with Dr. Richard Brow, for a new alloy to be used for hydrogen generation.

Dr. Newkirk continues to be involved with ASM, having recently been named to the New Products and Services Committee and the Aluminum Advisory Group, in addition to his work with the Handbook committee. He also has contributed a chapter for the new book, Steel Heat Treatment: Metallurgy and Technologies, which was published earlier this year.

It has been a busy and exciting year for Professor Bill Fahrenholtz. In October 2006, he received the “Young Distinguished Engineer Award” from the School of Engineering at the University of New Mexico. As part of the same trip, he delivered an invited presentation on ultra-high temperature ceramic research to the ceramics group at Sandia National Laboratories. In the spring, Professor Greg Hilmas, Shi Zhang, and Fahrenholtz were invited to give invited presentations at the Fifth China International Conference on High-Performance Ceramics in Chansha, China. In addition to Zhang, Tina Hilmas and Jill Fahrenholtz accompanied them on the 10 day trip to China that included a visit to the Chinese Academy of Ceramics-Shanghai Institute of Ceramics and Zhang Jia Jie, which is China’s oldest and most famous national park. This past summer has been no less busy with invited lectures at the Gordon Research Conference on Ceramics and the AFOSR Workshop on Ultra-High Temperature Ceramics. Finally, Professor Fahrenholtz found out that he will be named a Fellow of the American Ceramic Society at the MS&T meeting in September. He always looks forward to teaching Cer. 111 (sophomore lab) and MSE 422 (grad thermo) this fall.

MSE’s Tom O’Keefe and Jim Stoffer of the Chemistry department have been working for many years to develop environmentally friendly primers used to paint military aircraft. They have been successful and the F-15 System Program Office at Warner Robins ALC (Robins AFB, GA) are converting to the use of the new DEFT 02-GN-084 Non-Chromated Epoxy Primer for ALL F-15’s. Furthermore, O’Keefe, Stoffer and Eric Morris and Rich Albers of Deft, Inc were selected for a prestigious R&D 100 Award for best innovations of 2006 for their work on environmentally friendly primers used to paint military aircraft. Congratulations Tom!
and suggestions for improving what we do. Please send in your response. We will be asking for this information on an annual basis, with the hope of continuously improving upon our educational objectives. Our success is in large part due to our outstanding undergraduates, who work hard to maintain a professional attitude but at the same time have a lot of fun.

The Phonathon is coming up on October 21-25th, and 28-29th, and I hope you won’t vacate the premises on those nights. We’ll have a hard-working group of students calling for your help. Last year the the Metallurgy and Ceramics departments raised a record $86,701. Thank you for helping the future generations of UMR Metallurgical and Ceramic Engineers! Thanks also go out to all of the alumni who visit us regularly → believe me when I say it impacts the students when you come to our banquet, attend the reception at the convention, and talk to them in the hallways when you’re on campus.

This past year has been an enjoyable one for me as Chair, and I hope the same can be said for the students, staff and faculty. Please stop by when you can! We hope this newsletter finds you and yours in good health & spirits.

Wayne Huebner
September 2007

Enrollment

From the mid-90’s through 2004 the overall undergraduate enrollment in the MSE programs steadily declined, a result of many factors including an overall decline in the university enrollment, non-competitive scholarship packages, a low average number of employment opportunities, and a general lull in recruiting activities. The department took charge of its destiny in 2003 by hiring a full-time recruiter (Dr. Mary Reidmeyer, Ceramic Engineer, class of ’78, ’84, ’89), aggressively pursuing endowed scholarships, supporting the student groups to participate in outreach activities, and systematically building relationships with the industries that hire our students. Since then our enrollment has continually climbed (see figure), and this year’s incoming freshman class already has 38 students who have designated Metallurgy or Ceramics as their major. Academic Year 08 will see another increase, and we are ecstatic! Particularly since the number of job opportunities for our students continues to climb.

I would note that the Phonathon totals include $15,122 in matching funds from your companies. Hats off to:

- 3M
- Alcan
- Alliant Tech Systems
- Anheuser Busch
- Boeing
- Cerro Copper Products
- Dominion Foundation
- Exxon Mobil
- General Motors
- Goodrick Foundation
- IBM
- Jewish Federation of Metropolitan Chicago
- Komatsu
- Minerals Technologies
- Olin
- Saint-Gobain
- Tyco
- Valero Corporate Service
- Whirlpool
- AK Steel
- Alcoa
- Ameren
- Barclays Capital
- Caterpillar
- Daimler Chrysler
- Emerson Electric
- General Electric
- GKN Foundation
- Henkel Corporation
- Intel
- Lockheed Martin
- Northrup Grumman
- Peak Financial Mgt.
- Shell Oil
- United Technologies
- Wells Manufacturing

2006 Phonathon Sets Record!

The generosity of our alumni continues to play an important role in helping our students succeed. Last year you helped us set a record for the Phonathon: 378 MetE alums provided $59,418, and 146 CerE alums $27,283. These funds are used for many things that directly help recruiting and student professional development including:

- Freshman scholarships: Most of our endowed scholarships in the department do not allow us to give funds to freshman who have designated Metallurgy or Ceramics as their major. Phonathon funds can be used in this manner, and it’s allowed MSE to recruit one of our largest incoming freshman classes ever.
- Student group support: The Materials Advantage, FEF, AFS, Keramos and Alpha Sigma Mu student organizations participate in many activities that are important for their professional development as well as recruiting for the department. Phonathon funds paid for their participation in many events including Engineers Week in St. Louis at the Science Center, field trips to numerous local industries, “Mr. Wizard” activities at local K-12 schools, BBQ’s for alumni and potential students, and attendance at the Fall MS&T conference. For example, Keramos just won the Outstanding Student Award at the MS&T conference – collectively throughout the year they racked up over 1500 hours of service! They wouldn’t have been able to do this without your generous support.
- Undergraduate lab equipment & supplies: One of the major fund raisers for Materials Advantage this year was “slumping bottles.” With the help of Mary Reidmeyer and Jeff Smith they were able to design molds to slump the bottles into, and the appropriate T/t to yield optimum results. To increase the production rate Phonathon funds were used to purchase a new kiln (see pictures). Phonathon funds are also used to supply the Foundry with the materials they need to participate in the numerous tours which come through McNutt Hall. You’ll be glad to know that MSE is the top tour stop at UMR; last year over 2000 students came through.

Number of sophomore, junior and senior students enrolled in Metallurgical and Ceramic Engineering.

Please send in your...
Freshmen Class Profile
Fall 2007

Although all engineering students that come to UMR as freshman are officially Freshman Engineering students, we already know that 12 of them have designated Ceramic Engineering, and 26 have designated Metallurgical Engineering as their majors. This is our highest incoming class in 10 years! A few interesting facts about the incoming freshman class:

♣ Over 1030 students - one of the 3rd largest and most talented classes in UMR history
♣ 29 states (California to Virginia)
♣ 9 foreign countries
♣ Ave. ACT: 27.4 (upper 10% in nation)
♣ 77 Valedictorians and Salutatorians
♣ 86% interested in Engineering & Science fields
♣ 21% Undecided on a Specific Major
♣ Women (21%), Men (79%)
♣ Age: 18 years or less (98%)
♣ 76% Missouri, 23% out-of-state, 1% international
♣ 8.6% Underrepresented/minority students
♣ 36% are 1st generation college students

Departmental Scholarships at an All-time High

Budget cuts from the state have resulted in significant increases in tuition and fees for the students over the last 5 years. For a student entering UMR this fall their annual tuition and fees amount to $8,678 for in-state students, and $20,044 for out-of-state students. Add another $7,000 for room and board, and you can see that the cost of education represents a significant expense. That said, UMR is still one of the best deals in the country! The department is blessed with many alumni-endowed scholarships, and this fall we were able to award:

♣ Metallurgy scholarships: $184,350
♣ Ceramic scholarships: $99,850

In addition MSE undergrads also received over $75,000 in scholarships from professional organizations, including the Foundry Education Foundation (FEF), Association for Iron & Steel Technology (AIST), Women’s Auxiliary to the American Institute of Mining, Metallurgy and Petroleum Engineers (WAAIME), and the Southwest Section of the American Ceramic Society. Our students are successful pursuing these scholarships because they are talented, and active in the student organizations in the department.

MSE Faculty Lead the Campus in Productivity

The foundation of any successful organization is the quality of the people, and MSE is particularly blessed with outstanding students, staff and faculty. As a “small” department on campus we can maintain a family-styled atmosphere, which is great for helping students achieve their dreams. Currently our undergraduate student:faculty ratio is ≈10:1. Of course, financially this doesn’t pay the bills, yet MSE faculty have always maintained a high degree of research productivity to justify the department’s existence. This tradition began back in the 1960’s when MSM became UMR, and the MSE departments were allowed to hire additional faculty to pursue excellence in the research mission. This also coincided with the creation of the Materials Research Center. A few AY 06-07 facts about our faculty:

♣ Taught 9.2 hours (178 SCH’s), earned a 3.1 teaching evaluation score (campus average is 2.9)
♣ Over past four years, obtained more ‘Outstanding Teaching Awards’ than any department on campus
♣ On average generated $365K in research expenditures (1st on campus)
♣ Total research expenditures: $6.2M (1st on campus)
♣ Total indirects generated: $1.1M (1st on campus)
♣ On average received $318K in new proposals awarded (1st on campus)
♣ Over past four years, more ‘Faculty Excellence Awards’ than any department on campus (see other article in this newsletter).

Campus-Wide Initiatives

♣ Strategic Planning – Over the past year Chancellor Jack Carney launched a campus-wide strategic planning exercise. One overriding theme emerged from these discussions: for UMR to pursue recognition as a top 5 technological research university by the year 2011. This is a lofty goal with the competition defined as universities which have greater than 25% engineering enrollment, and greater than 50% engineering, business, science and mathematics enrollment. The accompanying figure shows which universities fit this definition, and where UMR fits in this analysis. By far we have the greatest percentage of each.

♣ University Name Change: After a lengthy debate concerning whether or not the name “UMR” represented us well, the decision was made to change the name of the university to something which more accurately reflected our heritage and aspirations. Effective January 1, 2008 UMR will now be known as the Missouri University of Science and Technology, or Missouri S&T for short. Our new logo (note the pick!)
Flattening of the Administration: In an effort to streamline processes and promote inter-departmental collaborations, effective July 1, 2007 the schools and college of UMR were eliminated along with the Deans. Concurrently several new central units were created, including the Office of Academic Services (headed by our very own Bob Schwartz, Vice Provost for Academic Affairs!), and an Office of Graduate Studies. In this new structure the 21 academic departments of UMR report directly to the Provost.

Advancing Excellence Campaign: After the successful completion of the $60M Full Circle Campaign in 2000, the campus worked towards launching a new capital campaign: the $200M Advancing Excellence Campaign. The campaign objective is to help us achieve top 5 status as a technological research university. This campaign is particularly important to ensure the future viability of Missouri S&T, since the percentage of our budget supported by the state of Missouri has continued to dwindle. Once 50% of our budget, state funding now represents less than a third of our budget. The quiet phase of the campaign began in July 2003, and the public launch was announced April 19, 2007. How are we doing so far?

University Research Park: Recently the Board of Curators announced their approval of UMR’s plan to establish a University Research Park. The goal of this park will be to foster entrepreneurial activity as an outgrowth of our research mission, thereby creating intellectual property revenue for the campus, as well as jobs for our graduates and the region. The park is slated to be located on the 9-hole golf course immediately adjacent to the football stadium as shown in the aerial view.

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DR. ALAN CRAMB: PRESENTS 18th GOLICK MEMORIAL LECTURES

Dr. Alan W. Cramb, the Dean of Engineering and the John A. Clark and Edward T. Crossan Professor of Engineering at Rensselaer Polytechnic Institute, was selected as the 18th Golick Memorial Lecturer. Dr. Cramb presented two lectures, “Issues in the Strip Casting of Steels,” on Thursday, April 5, 2007 and “Seeing is Believing: Adventures in High Temperature Microscopy,” on Friday, April 6, 2007 in McNutt Hall on the UMR Campus. Dr. Cramb is one of the foremost experts in ferrous metallurgy having spent nearly 20 years on the Materials Science and Engineering faculty at Carnegie Mellon University where he was the co-director of the Center for Iron and Steelmaking, the Posco Chair, and the Head of the Department. He is the author of over 180 publications and 2 patents and the recipient of numerous awards from the AISI, TMS, ISS, ASM and AIME. He has served as President of the Iron and Steel Society and the AIME and was elected a Fellow of the Iron and Steel Society.

The A. Frank Golick Memorial Lectureship was made possible by a gift to the department by Mr. Golick’s widow in 1969 for the purpose of attracting outstanding, nationally recognized metallurgical engineers to the campus to interact with the faculty and students, and to present a lecture series. Mr. A. Frank Golick was a 1918 metallurgical engineering graduate of the Missouri School of Mines and Metallurgy and spent most of his career at LaSalle Steel Company where he was Vice President for Sales from 1946 until his death in 1966.
What’s New at MS&T?
(besides our name change from UMR to MS&T)

Science Meets Art at MS&T
An exciting new addition to the Department of Materials Science & Engineering is a hot glass studio along with a kiln working area. What better opportunity to introduce undergraduates to glass behavior first-hand and the non-technical community to the science of glass. It is just the beginning, but just think of the possibilities with future expansion.