

Material News

Department of
Materials Science & Engineering

Home of Ceramic and Metallurgical Engineering

A newsletter for the alumni of the Metallurgical, Ceramic and Materials Engineering programs of the Missouri University of Science and Technology



Chair's Corner

Dear Alumni, Colleagues and Friends,

Greetings from Rolla! Every year when I help assemble the newsletter I find myself thinking "we'll never be able to top this year." But once again I marvel at the accomplishments of the students, faculty, and alumni this past year.

Ceramic and Metallurgical Engineering both have healthy enrollments (85 MetE and 99 CerE Fr/Soph/Jr/Sr) – a number down 9% from last year, but a number we can better handle in terms of lab facilities and placement. With 17 faculty our student:faculty \approx 12:1, a highly desirable ratio, but one that carries with it a responsibility to maintain a high research productivity. It's no accident that MSE still leads the campus in research/faculty member by over a factor of two. A simple matter of maintaining standards set by faculty 50 years ago. We stand on the shoulders of giants; Professors Planje, Moore, O'Keefe, Day, Wolf, Straumanis, Anderson, Askeland, Kisslinger, Kohser, Leighly, Ownby etc. laid the foundation for what we do today, and we strive to honor them by giving today's students the very best as well.

This newsletter reports on many items that all reflect one thing: student success is priority #1. I know you will enjoy reading about all the great things going on. You can be proud of the student groups and all of the service activities they do to inspire the next generation of engineers and scientists. It's no wonder they won national awards again this fall at MS&T 2012. Thanks again to Bill Horst ('51 MetE) and his wife Ann for endowing the Thomas J. O'Keefe Student Professional Fund – having a budget allows the student groups to strategically plan activities throughout the year. Also this year many distinguished alumni and leaders came to the department to give lectures, most notably Ben Winter (MetE '80), the Thomas J. O'Keefe Lecturer, and Dan Shechtman, the Golick Lecturer. Professor Shechtman received the 2011 Nobel Prize in Chemistry! Both gentlemen gave inspiring seminars to the students. This fall Scott Morrison ('85 Ph.D. MetE) gave the 4th O'Keefe lecture – details are herein.

The Phonathon will be held a little later this year: October 25th, 28th - 31st, November 1st and 4th. You probably received this newsletter just a few days before the event. As always, we'll have a hard-working group of students calling for your help. Last year the MetE and CerE students raised a total of \$69,347 down 12.5%. Thank you for helping the future generations of Metallurgical and Ceramic Engineers!

You may not realize this, but it is not an understatement to say that without the strong support of our alumni the department would cease to exist. Alumni created the endowments that allowed us to give \$342K in scholarships to the undergraduates this year, provided over \$100K to help run the labs, purchased \$136K of new (desperately-needed!) metallography equipment every student in the department will use, and provided a new \$2.8M endowment that allowed us to create the Roberta and G. Robert Couch Assistant Professors of Materials Science & Engineering. This endowment allowed us to attract our two newest faculty members, Mohsen Asle Zaeem and Caizhi Zhou. Both men are experts in computational materials science.

Is it even possible to appropriately thank you for such tremendous support? The only way imaginable is to focus our undivided attention on giving today's students the tools they need to succeed. It's our passion, and our responsibility. And you may be rest assured that we are steadfast in this mission.

We hope this newsletter finds you
and yours in good health & spirits.

Wayne Huebner
October 2012

Congratulations Graduates!

The past two semesters almost all of the MSE graduates had a job when they walked across the stage. The average starting salary of MSE 11/12 graduates:

Met: \$60,437
Cer: \$58,736

The accompanying figures show where the CerE and MetE graduate have been employed over the last six years.



December 2011 Metallurgical Engineering Grads



May 2012 Graduates



December 2011 Ceramic Engineering Grads



StudentNews

Keramos & Material Advantage Groups win National Awards at MS&T 2012



(8 years in a row; 12 of the last 14 years!)



Ann and Bill Horst
MetE '51, '52
Thomas J. O'Keefe Student Professional Development Fund

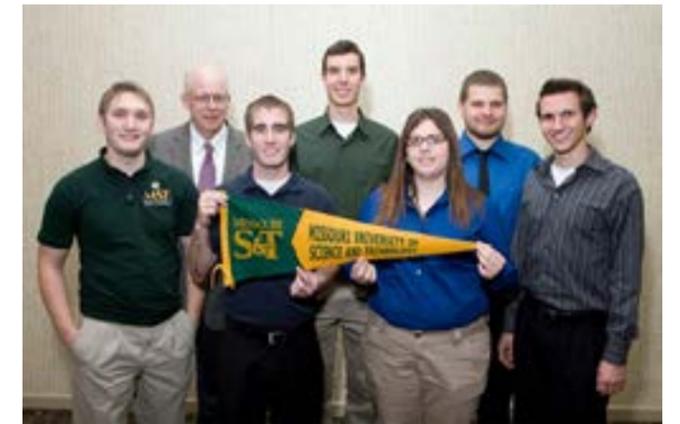


Material Advantage Chapter of Excellence Award for the last 5 years

FEF College Industry Conference

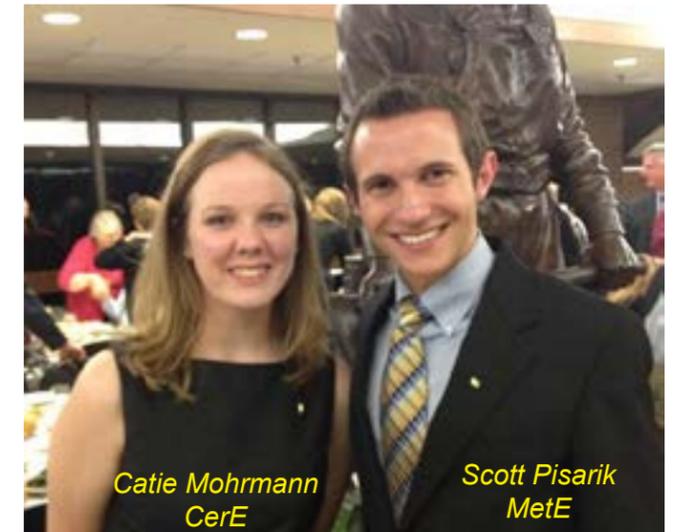
The 64th annual conference was held in November in Chicago. Over 225 industry executives from 60 companies, students (87), and key professors were in attendance. In total \$47,500 in scholarships and awards were presented - Evan won the Robert Wolf Memorial Scholarship and David won the Carl Loper Scholarship Award.

Professor Von Richards is a FEF Key Professor, and makes sure our students always are in the hunt for CIC and FEF scholarships and awards !



L to R: Chris Ferguson, Von Richards, David Hengst, Evan Kluesner, Jamie Fitzgerald, Clint Ratliff and Scott Pisarik

New Academy Scholars inducted at the Spring Mines and Metallurgy Academy



Catie Mohrmann
CerE

Scott Pisarik
MetE

2012 Alfred R. Cooper Young Scholar Award

Glass and Optical Materials Division of the American Ceramic Society



Colin Ryan (Sherman, IL), a ceramic engineering senior in the MSE Department received the 2012 Alfred R. Cooper Young Scholar Award from the Glass and Optical Materials Division of the American Ceramic Society during MS&T12 in Pittsburgh, PA. The award is given annually to recognize

research conducted by undergraduate students. Colin's project was entitled "Conversion of Eu- and La-doped borate glass to rare earth phosphate solid solution compounds" and the award reviewers "were impressed with the quality of his research as well as the impact and importance of his scientific findings". Colin is mentored by Jaime George (Hornell, NY), a PhD candidate in the Brow Research Group. Colin will receive the award and present a paper on his findings at the MS&T meeting in Pittsburgh in October.

Gaffer's Guild News

The fall semester is in full swing and Gaffers Guild is on the move. To get the year going right, we had a BBQ and made it rain! One would have thought this would not have been a problem with the ongoing drought and conveniently, it quit raining when we stopped eating. We have expanded our membership in the last year. It is estimated that we have roughly doubled in active members. We hope to sustain this trend.

In keeping with tradition, Gaffers Guild will have a booth at the Rolla downtown craft sale during this year's homecoming. And like last year, we will have a marvelous pumpkin patch! We will also have glass blowers in the MSE Hot Shop strutting our stuff to the public. A new addition to this is a "stamp your own medallion" event coinciding with the homecoming craft sale. We tried this out in the spring and it was a success. It allows younger and less experienced persons to make glass medallions that they personally help create. The participants got to pick the stamp design and color. A gaffer would prepare the glass and a second gaffer would instruct the participant how to safely shape the gob of glass. We had over 20 people participate in the event and hope to have more this fall.

Using fundraised monies, the group is hoping to bring a professional glass artist to campus to teach the group more advanced techniques. A major project the group has decided to undertake is the creation of a mobile glass shop. The hope is to not limit ourselves to a single location and spread further awareness in Rolla as well as in neighboring communities. The group has purchased a trailer and conceptual designs have begun. The group hopes to create a 40lb to 50lb glass tank furnace that can be ramped up and down in the course of 36 hours. Already acquired equipment includes the 12 inch gloryhole furnace and an annealer furnace skeleton. Gaffers Guild hopes to acquire enough funds to build and customize the trailer to fit their needs in the next year. We hope to have a successful year and continue to share the passion of glass.



Dylan Martinez showing us how it's done



Missouri S&T's youngest gaffer!

American Foundry Society: Missouri S&T Student Chapter

Open Foundry

The AFS student chapter held three open foundries during the 2011-2012 school year, one in the fall and two in the spring. Tim Wolfe, president of the University of Missouri System, visited the S&T Foundry on April 4th. AFS members and unlucky graduate students spent the days prior to the event cleaning the foundry in preparation for his arrival, which proved to be worth it in the end. Mr. Wolfe was thrilled by the ingenuity of the S&T AFS students, and the iron pour that he witnessed first-hand. Students were happy to share their experiences in various labs held in the foundry, such as Metals Casting, and to answer any of the president's questions. AFS hopes to show off the foundry to more and more curious visitors, and they are once again opening their doors to MSM/UMR/S&T alumni on October 13th during homecoming for their first Open Foundry of the fall 2012 semester!

First-Ever BBQ Branding Iron Competition

Last semester, AFS held the first ever Barbeque Branding Iron Competition. The program, hosted in part by the S&T BBQ Club, consisted of AFS members and casting enthusiasts creating their own BBQ branding irons – from start to finish. All participants were expected to create their own brand out of iron by whatever means necessary. Most chose to use the standard lost foam method, while others were more adventurous and either used investment casting or created their own pattern for use with no-bake sand. There were about eight brands in the end, machined for use with an interchangeable handle. The brands were also seasoned to ensure they keep up with the BBQ Club's demands. The branding competition was held on April 15th on the painted street. Members of the BBQ club grilled burgers and hotdogs for the attendees and special steaks for the competitors. Each participant received a steak with their brand mark on it, while a member from AFS and two members from the BBQ Club judged the brands. The categories consisted of: 1st, 2nd, and 3rd place along with best design, and most creative. In the end, the BBQ Club was happy to have new brands which were representative of S&T that they could use for all of their events, and the AFS members walked away with prizes donated by one of the AFS St. Louis Chapter members. AFS is looking forward to making this a yearly design competition that will draw more attention from the St. Louis AFS Chapter and beyond!



April 4, 2012. Tim Wolfe, President of the UM System, witnessed an iron pour in the S&T Foundry.



Photograph of the student participants in the 2012 BBQ Branding Competition. William Howells from the St. Louis AFS Chapter also attended the competition and provided multiple prizes. From left to right: David Hengst, Chris Heckman, William Howells, Laura Kraus, Evan Kluesner, Ross Jensen, Jennifer DeHaven, and Calum Learn

Student Groups Assist with Merit Badge University - February 2012



Faculty and Staff News



Dr. Mohsen Asle Zaeem joined the department this August as Roberta and G. Robert Couch Assistant Professor of Materials Science & Engineering. Prior to joining Missouri S&T, Dr. Zaeem was a postdoctoral fellow and an assistant research professor in the Computational Manufacturing and Design group within the Center for Advanced Vehicular Systems (CAVS) at Mississippi State University. Mohsen received his B.S. (2003) and M.S. (2006) degrees in Mechanical Engineering from Shiraz University, Iran, and his Ph.D. in Mechanical Engineering from the School of Mechanical and Materials Engineering at Washington State University (2010). As a graduate student, he received the Outstanding Teaching Assistant award of Washington State University. He is a member of ASME, TMS, ASM International, ASEE, and IIS. Dr. Zaeem has authored or co-authored more than 30 journal and conference publications. His current research interests include developing different phase field-finite element models for predicting nano- and micro-structural evolution during solidification, grain growth, and solid state phase transformation in light-weight and high-strength metallic alloys. His main research goal is to develop multi-scale computational tools to predict and improve mechanical and other properties of materials for different engineering applications. Mohsen is married to Sanaz Yazdanparast, who is currently a Ph.D. student in the Department of Materials Science and Engineering at Missouri S&T.



Dr. Michael Moats joined the department this August as an Associate Professor. He returns to us from the University of Utah where he has been a faculty member in their department of metallurgical engineering for the past seven years. Mike is an alum having received his B.S. and M.S. degrees in metallurgical engineering from UMR in 1992 and 1995, respectively. His M.S. advisor was Thomas J. O'Keefe. He received his Ph.D. in materials science and engineering from the University of Arizona in 1998 for his work on copper electrorefining and the problem of anode passivation. Besides his academic experience, Mike has worked for ARMCO Grinding Systems at their Kansas City operation as a quality control metallurgist for grinding media and ELTECH Systems as a researcher and manager developing ceramic coated titanium anodes for industrial electrolysis. Dr. Moats holds four patents, has authored or co-authored 65 publications and one book (Extractive Metallurgy of Nickel, Cobalt and Platinum Group Metals). His main areas of research

are related to the primary processing of non-ferrous metals by hydro- and electro-metallurgical methods. He has been the project leader for AMIRA's \$1.5 million P986 (Improving Crushed Ore Agglomeration) project and will be leading their P705C (Base Metal Electrowinning) project in the future. He has worked with many large mining companies including Freeport-McMoRan, Rio Tinto, BHP Billiton, Newmont and Vale. Dr. Moats is very active in service as he is on the SME-MPD Executive Committee, helped organized Electrometallurgy 2012 and is serving on the organizing committees for Ni-Co 2013 and Copper 2013 for TMS. He is also the coordinator for the Copper Refinery Group, an industrial consortium of eight North and South American copper refineries. Mike is married to Michele (Keith) Moats, an alum of UMR (EE, B.S. 1993 and M.S. 1996) and has two daughters Mallory (8) and Morgan (5).



Professor Dick Brow,
President of the American Ceramic Society

Curators' Professor of Ceramic Engineering



Professor Peaslee,
President of the Association for Iron and Steel Technology

Kenneth J. Iverson Steelmaking Chair



Professor Bill Fahrenholtz named 2012 Curators' Professor and Mines & Metallurgy Academy Professor

Four Horsemen of the Apocalypse are all Curators' Professors



Festschrift for Professor Delbert Day



During the Glass and Optical Materials Division of the American Ceramic Society meeting in St. Louis, MO on May 20-24, 2012, a Festschrift was organized to celebrate the research career of **Delbert E. Day**, Professor Emeritus of Ceramic Engineering at Missouri S&T. Technical sessions were organized that highlighted Prof. Day's long and productive career, including sessions on phosphate glasses, the mixed alkali effect, glass nucleation and crystallization behavior, and bio-glasses. Many alumni, colleagues and former students participated.

Schlesinger Awarded Eiriksson Fellowship



Mark Schlesinger has been awarded one of 38 Leiv Eiriksson Fellowships for the 2012/2013 academic year by the Research Council of Norway. He will be spending the year at the National Technical University of Norway in Trondheim, working on recycling-related projects and completing the second edition of his book, Aluminum Recycling. NTNU is closely associated with the Norwegian research institute SINTEF, and Mark intends to develop a working relationship that will lead to joint research programs down the road. He also intends to discover his Inner Viking.



Mark Schlesinger was the lead author (chief butt-kicker) for the fifth edition of Extractive Metallurgy of Copper, published last fall. The book describes the entire life cycle of copper, from geology and mining to recovery and recycling, and is considered the standard monograph in the field. Mark says the book is full of sex ("that's how we got the solution pregnant") and violence ("the chapter on scrap processing is not for the faint of heart"), Co-authors include department alum Matt King, who is now one of the world experts on sulfur capture and sulfuric acid production from smelting operations

Welcome to our two new Senior Secretaries



Vicki Rowden



Nicole Dietiker

Alumni News

New Academy Members Ricky Martin and Phil McPherson inducted at the Spring Mines and Metallurgy Academy Meeting



Ricky Martin
MetE, '82

Phil McPherson
CerE, '83

Distinguished Young Alumni Award



Natlie Vanderspeigel
CerE '02, '04

Senior Manufacturing Engineer for Solar Turbines in San Diego, California

Wholly owned subsidiary of CAT

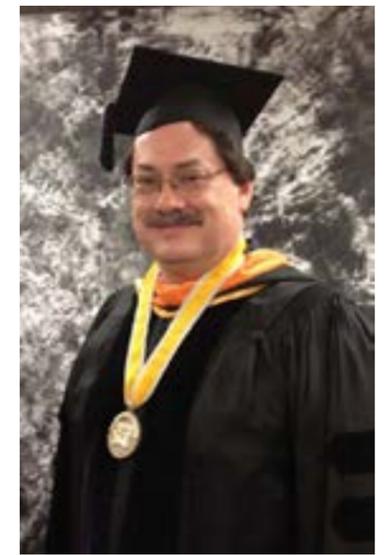
AY 11/12 Professional Degree Recipients



Rebecca Johnson
CerEng, B.S. '83, Eng Mgt M.S./ Ph.d./ '92/'99
Deputy to the Commanding General, Fort Leonard Wood



Gary Pennell
MetEng., B.S. '97
Chief Metallurgist
Nucor-Yamato Steel Co



John Brannon
B.S. CerE '85, Phys '85, Psych '86, M.S. CerE '86, Ph.D. '89
Patent Attorney & Chief Executive Officer, Brannon & Associate PC

'94 CerE Alumnus Dan Krueger named one of Ingram's 40 under Forty

Krueger among Ingram's 40 under Forty

For the past 14 years, Ingram's Magazine has recognized Kansas City's young executive talent in their 40 Under Forty feature. This year, Dan Krueger was included in the group of influential professionals in the Kansas City business community featured in the April 2011 issue.

Krueger is a Principal Mechanical Engineer in Microelectronics at Honeywell FM&I. He began his career in Ohio as an engineer with Philips Electronics before joining Honeywell FM&I in 1996.

Krueger holds a bachelor's degree in ceramic engineering from the University of Missouri-Rolla (now called Missouri University of Science and Technology) and a master's degree in mechanical and aerospace engineering with a materials science minor from the University of Missouri.

Development

MSE Alumni Support the Students!

Metallurgy scholarships: \$219,300
 Ceramic scholarships: \$122,675

MSE undergrads also received over \$125,000 in scholarships from professional organizations (FEF, WAAIME, AIST, SW AcerS, Copper Club, Modern Casting....)

- FEF: Foundry Education Foundation
- AIST: Association for Iron & Steel Technology
- WAAIME: Women's Auxiliary to the American Institute of Mining, Metallurgy and Petroleum Engineers
- SW AcerS: Southwest Section of the American Ceramic Society

Roberta and G. Robert Couch Assistant Professors of Materials Science & Engineering

AIST Scholarships

Missouri S&T MetE students captured the top scholarships from the steel industry through the AIST Foundation.

- Lindsay Golem AIST Foundation Premier Scholarship (\$10,000/year for 2 years)
- Calum Learn Ferrous Metallurgy Education Today
- Andrew Russo Scholarship (\$5,000/year for 2 yrs)
- Jonathon Turner
- Colin Welshymer

This is the 5th year in a row that a Missouri S&T Metallurgical Engineering student has received the Premier Scholarship: Jennifer DeHaven, Scott Pizarik, Roger Rettig and Tom Bailey preceded Lindsay.

Fall 2011 Phonathon Results

	Ceramic		Metallurgy	
	2011	2010	2011	2010
Total Records	508	600	1159	1304
Pledge Dollars	\$28,731	\$28,605	\$21,980	\$33,520
Matching Dollars	\$7,906	\$7,785	\$6,525	\$9,380
# Matching Pledges	36	29	41	68
Total Dollars	\$36,637	\$36,390	\$32,710	\$42,900
Total Donors	128	164	187	311
Average Pledge	\$224	\$174	\$117	\$108
Average Pledge with Match	\$286	\$222	\$175	\$138

Fall 2012 dates: October 25th, 28th, 29th, 30th, November 1st, 4th

The 4th Annual Dr. Thomas J. O'Keefe Lecture, October 11, 2012



Scott Morrison
 CEO Metalor Technologies
 SA
 MetE Ph.D. '85

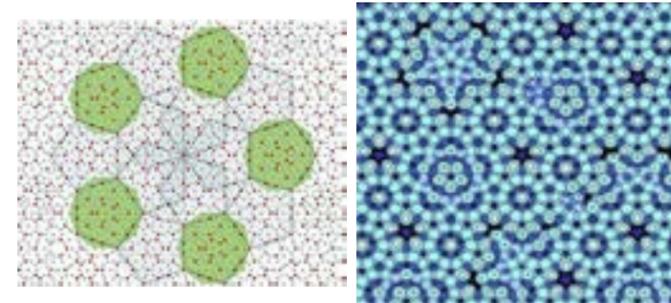
"The Precious Metals Industry - Some Insights Nobel, Precious or Both?"

23rd A. Frank Golick Lectureship February 13th & 14th, 2012



Dr. Dan Schechtman
 Philip Tobias Professor of Materials Science
 Technion Israel Institute of Technology, Israel

2011 Nobel Prize Winner in Chemistry "for the discovery of quasicrystals."



He received many awards and was the holder of numerous patents relating to his work with high temperature materials. In 1973 he and his wife moved to a farm in Jefferson County, West Virginia and for the next 30 years he was a proud full-time farmer raising Angus cattle. In 1998 he received an award as Jefferson County Conservation Farmer of the Year. One of his proudest accomplishments was his donation of a 90-acre perpetual conservation easement on the Potomac River dedicated to and jointly managed by the Potomac Conservancy and the Jefferson County Farmland Preservation Bureau. In 2011 Mr. Olcott's widow, Margaret W. Olcott, provided funding for the creation of the Eugene L. Olcott Metallography Lab at Missouri S&T for the purpose of giving future generations of Metallurgical Engineering students the very best training in preparing samples for microstructural characterization.



Dedication of the Eugene L. Olcott Metallography Laboratory

Date: Saturday, August 25th, 2012
 When: 3:00 - 5:00 pm
 Where: B7 McNutt lab dedication with reception afterwards in the McNutt Commons

Eugene L. Olcott was born on April 18, 1918, in St. Louis, MO. He passed away December 4, 2009. Graduated from the Missouri School of Mines with a degree in Metallurgical Engineering in 1940. He was a member of Theta Tau, an engineering fraternity. During WWII he worked as an engineer for the Department of Navy designing propellers for ships; after the war he designed nose cones for rockets. After his government service he worked for many years for Atlantic Research Corporation as a high temperature materials engineer on aerospace projects.



Non Profit Org.
U.S. Postage PAID
Permit No. 170
Rolla, MO