A Newsletter for Friends & Supporters of the Colorado School of Mines George S. Ansell Department of Metallurgical & Materials Engineering

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MINES METALLURGICAL & MATERIALS ENGINEERING

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FROM THE DEPARTMENT HEAD

Welcome from
Dr. Angus Rockett

Dear Friends of Metallurgical and Materials Engineering,

The start of a new year and, some would say, a new decade brings an exciting spring semester to the George S. Ansell Department of Metallurgical and Materials Engineering. MME is busy with many activities as you will see from this newsletter. The department is in the final stages of a search for faculty to replace our two recent retirees, Stephen Liu and Steve Thompson. We are excited about the candidates and will have more news to share in coming newsletters once negotiations to bring them on board are complete.

We have added a temporary staff member this spring to supervise the hot shop (foundry, glass shop, welding and forging). We would love to make this position permanent and provide on-going, as well as increased, guidance to students using these facilities. If you have the resources to donate in support of that position, we would greatly appreciate it. This past academic year, Professor Zhenzhen Yu has organized an open lab approach to allow active welding in the high-bay area two afternoons per week, and the glass shop is in nearly constant use so there is a lot of opportunity for students to be included in hands-on activities.

Toward the end of last summer, the first meeting of the MME Alumni Advisory Board was held on campus and provided valuable advice. We will be holding a teleconference with the board at the end of January to review where the department stands and to get their input on several questions related to maintaining the traditional strengths of the department and continuing to advance our programs.

We have exciting news of successes in research and in particular we just found out that Vladan Stevanovic has been awarded an NSF CAREER Award, bringing the total to five active CAREER awards in the department, which represents over 5 percent of the total number of active CAREER awards in Colorado. Nearly all of our assistant professors in the past 10 years have received this highly competitive and prestigious award. Ryan O’Hayre continues to enjoy a world-traveling sabbatical learning new approaches to battery and fuel cell technology and sharing his discoveries from Australia to Norway.

The department continues to work on improving student support, especially to identify and support students struggling with depression or other issues that arise from the challenging environment here at Mines. We are also working on implementing our diversity, inclusion & access plan, which aims to enhance the climate for all of our students. Our objective is to make MME an even more welcoming and happy environment for study and research.

Wishing you a joyous spring 2020. Please reach out if you have any comments or questions.

Dr. Angus Rockett | arockett@mines.edu
Humans of Mines: the Every Oredigger Initiative and what MME is doing to support it

"Groups that support each other are stronger than the sum of the individuals. I had the opportunity to participate in Applied Suicide Intervention Skills Training (ASIST) at Mines recently, and it was a tremendously impactful experience.

"Life at Mines is often quite stressful for students, faculty and staff, and it can be easy to overlook or not be able to easily identify fellow Orediggers, friends and family who are struggling with mental health — it’s generally more obvious and socially acceptable to discuss physical health issues with our friends and colleagues than to talk about our inner struggles.

"ASIST gives you the tools to support your friends, family and colleagues with mental health ‘first aid,’ in a very similar way to how you might save a life by performing CPR — simple and easy-to-remember guidelines so that you can identify someone who might be struggling and help them when they are in need. The toolkit that you leave the training with is incredibly valuable and has given me confidence that I can make a difference.

“Participating in ASIST also gave me the opportunity to get to know many Orediggers I had not met before who are also very invested in making Mines the best it can be and who recognize mental health is something we need to talk about more openly. The stories and experiences that were shared over the two days made me feel more like a real part of the Mines community — a group that is stronger than the sum of its individuals.”

#EveryOredigger is a comprehensive campus-wide initiative aimed at promoting mental health, championing resiliency and preventing suicide at Mines. For more information, visit mines.edu/everyoredigger

Follow Humans of Mines at facebook.com/humansofmines
High Grade: MME in the Arts

Speaking of art, did you know that Mines has published a literary arts journal called High Grade every year since 1976? The journal features all genres of original fiction, creative nonfiction, poetry, photography, art and music from Mines students, faculty, staff and alumni.

Alexandria Leto, editor-in-chief of this year’s edition, shared her thoughts with us on what makes High Grade a unique part of campus: “High Grade provides us—as students and faculty—with an opportunity to express ourselves creatively. It showcases the amazing multitalented minds we have here on campus. Being in such a STEM-heavy environment, it reminds us of the equal importance of art in the world we live in.”

Cliff Ghiglieri, nuclear graduate student working with Dr. Jeff King, has two contributions.
Mines Researchers test how 3D-printed materials perform inside a nuclear reactor

Could 3D printing, also known as additive manufacturing, solve the difficulty of finding replacement parts for nation’s aging nuclear plants? As our nation’s nuclear plants age, it’s becoming increasingly difficult to find replacement parts—the shapes and sizes are unique, plus they must be able to withstand a harsh, radioactive environment.

But Mines researchers are studying a novel question: could 3D printing—also known as additive manufacturing—be the solution to this problem? The researchers, led by Jeff King, associate professor of metallurgical and materials engineering, are testing how 3D-printed materials perform in a nuclear reactor. The results of this four-year, $2.5 million study, funded by the U.S. Department of Energy, have the potential to revolutionize the nuclear power industry.

“Most of the reactors in the U.S. are more than 40 years old, and many of the companies that made the original parts no longer exist,” said King. “There’s a huge problem of trying to find replacement parts and/or certifying replacement parts. One theory is if you could make on-demand parts of specific geometries through additive manufacturing, this could be very helpful in keeping our aging nuclear fleet performing.”

For the nuclear industry, the big question revolves around safety and how 3D-printed materials behave inside a nuclear reactor. The researchers want to understand whether 3D-printed materials are uniquely vulnerable to radiation damage or are, in fact, stronger and more durable than conventionally manufactured materials.

Though it’s still early, the researchers are hopeful about the study’s potential to advance nuclear power, one of the most sustainable and environmentally friendly energy sources available today.

Mark Graham, a graduate student working on the project said,

“If we can aid in the advancement and efficiency of this technology, we can hope to provide clean energy to everyone and reduce our predicted impact on the environment before it’s too late.”

Full article available at minesnewsroom.com
De Moor wins AIST Peaslee Award

A Colorado School of Mines professor has received a junior faculty award dedicated to young investigators interested in the iron and steel industry.

Emmanuel De Moor, an assistant professor in the Mines Advanced Steel Processing and Products Research Center (ASPPRC), received $35,000 as the recipient of the Kent D. Peaslee Junior Faculty Award from the Association for Iron and Steel Technology (AIST). The award is intended to increase the number of young faculty in the iron and steel industry. The award is named after Kent D. Peaslee who received his bachelor’s degree in metallurgical engineering from Mines in 1978.

The award can help fund steel-related research projects, develop university-industry relationships, recruit students and help young professors become better informed about the steel industry.

De Moor’s research focuses on physical metallurgy and the study of the effect of heat treating on microstructural development and mechanical properties.
MME's Outstanding Graduating Senior

Melissa Dangler, Metallurgical and Materials Engineering
Dangler, of Lakeland, Florida, plans to go into industry before returning to school to pursue a PhD.

Favorite Mines memory: The fondest memories I have of my time at Mines were all spent in Dr. Bourne’s classes. I’ve learned a lot from him and enjoyed his humor along the way. The day that he retires, Mines will lose one of their best.

News from the Colorado Center for Advanced Ceramics

GMIC Glass Plant Tour Grant awarded to Ceramics students - the Glass Manufacturing Industry Council is awarding Colorado School of Mines a grant in the sum of twelve hundred dollars ($1200) to support student tours of glass manufacturing facilities in 2020.

The tours will be offered through courses taught at Mines, including the Art and Science of Glassblowing and Field Session. Students will be able to visit local plants to learn how glass is manufactured. It is a great opportunity to get insight into the glass industry.
Cross Country Winners

GRAND JUNCTION, Colo. – The Colorado School of Mines Men’s Cross Country team won the RMAC crown and the Oredigger women claimed silver on Saturday morning at the 2019 conference championships hosted by Colorado Mesa at Tiara Rado Golf Course.

RMAC Runner of the Year Dylan Ko carried Mines’ men to their third title in the last four years as he raced to individual gold in a time of 23:20.9. All five of the Orediggers’ scorers finished inside the top 10 with Mines’ top seven finishing 20th or better. In total, the Oredigger men claimed nine All-RMAC honors with Ko, Kyle Moran, Luc Hagen, Ben Schneiderman, Jake Mitchem and Max Sevcik earning first-team distinction while Bo Raadam, Joseph Wolfe and Miller Kettle claimed Second-Team All-RMAC accolades.

Chloe Cook was the lady who helped Mines’ women match the best team finish in program history. Cook crossed the finish line in fourth place after racing the 6,000-meter course in 20:24.8, marking the fastest 6K time of her career. It was also the highest finish ever at a RMAC Championship for the redshirt senior. Cook’s fourth-place finish highlighted a total of seven All-RMAC honorees for the Orediggers. Zoe Baker and Morgan Molesworth joined Cook on the first team. Maddie Geesen, Molly Maksin, Brin Strouse and Brook Eberle accounted for Mines’ second-team contingency. In total, the Oredigger women placed eight individuals in the top 31.

Veteran’s Resource Center

Colorado School of Mines recently opened a new Veterans Resource Center to serve student veterans on campus.

Michael Knight, a U.S. Marine Corps veteran and president of the Mines Veterans Alliance, shares some of the resources available. Knight is pursuing a PhD in materials science, working under Professor Ivar Reimanis on advanced ceramic materials for fuel cells.

“My one piece for advice for student veterans who are just starting at Mines would be to go above and beyond. Don’t just show up for classes and do classes—actually interact with other students,” Knight said. “Having a community is hugely important to success.”

The Veterans Resource Center is located at 1607 Washington Ave. For more info about Mines veterans services, go to mines.edu/veterans
The Balancing Act

The balance between the classroom and competition is one that Mines student-athletes master every year. It’s not easy fitting in lectures, labs, homework and projects with training, practices, travel and competition. But despite these pressures, Orediggers have continued to excel at both sides of the equation.

In 2018-19 alone, Mines Athletics had five RMAC Academic Athletes of the Year and an all-time record of 16 Academic All-Americans, and more than half of the 400+ Mines student-athletes held a 3.0 or above cumulative GPA after the spring 2019 semester.

“When I’m training, and I have multiple workouts a day, I have to prioritize a lot more,” said Jake Feldman ’19, a starter for the RMAC-champion wrestling team. Feldman received his bachelor’s degree in metallurgical and materials engineering in May and is currently working on a master’s degree in engineering and technology management while competing in his final season. “I’ll build a list every day—practice at this time, lifting at this time, classes later in the day. Some weeks are worse than others, but it works out.”

Traveling for competition puts extra pressure on academics because it often takes student-athletes out of the classroom and lab. In 2018-19 alone, the Mines wrestling team covered more than 8,000 miles on the road and in the air, but that doesn’t mean they’re given a free pass in class.

“I’m really used to studying on buses,” Feldman said. “And if we’re at a hotel and we have breakfast at 9 a.m., I’m up at 7 a.m. studying, and most of my teammates are doing the same thing. We know we have a job to do at the meet but also have to take care of business at home.”

To read the full article from 10/8/19: minesmagazine.com/15492
James D. Cotton/alum is chairing the new IMAT2020 conference next year in Cleveland, along with Luc Pouliot of Tecnar Automation. Planning is well underway for IMAT 2020, ASM’s re-imagined Annual Meeting. A diverse group of materials experts, including the ASM Programming Committees, AeroMat Committee, and all six of ASM’s Affiliate Societies, are heavily involved in building the technical symposiums, which will have a strong focus on application-oriented, real-world technologies that can be put to use today.

More information is available at 
asminternational.org/web/imat

“You want to have a worldly experience? You should be here.”

As part of the Mines Minute video series, where you can “meet some of the Orediggers who exemplify what you can do to be a #HelluvaEngineer”, Mines (and MME) alumnus Giuseppe Liberati ’02 talks about the vibrant global culture at Mines and the opportunities it provides, including his own career journey.

Meet Giuseppe Liberati ’02, GM and Chief Strategist at Bridging Value LLC, a business development company based in Houston. “Mines, to me, is a small UN, where technical people and focused engineers are gathering to share energy, share ideas and solve problems,” Liberati said. “We have people from 78 countries on campus. We can put that layer of culture on all the problems we are solving. Because, ultimately, we are doing something for the people.”

Watch the video at: 
youtu.be/vF8MQseEDBI

Dr. Zhenzhen Yu had her second baby, Lucas, on Monday January 13th. Dr. Yu, her husband and first son, Adam, welcomed their new bundle a little early but both mom and baby are doing well!
SUPPORT MME

A gift to the George S. Ansell Department of Metallurgical and Materials Engineering is an investment in the future.

Gifts can support scholarships, fellowships, professorships, academic programs, faculty research and other initiatives that are not typically supported through state appropriations. Private philanthropy empowers the Department to achieve greater excellence in research and education.

To learn more about supporting the Department, contact the Mines Foundation at weare.mines.edu/supportmme or call 303.273.3275.

Benjamin Ellyson shapes a hammerhead on the forging press.