

Summer 2013 Volume 103 Number 2

Mines

Colorado School of Mines Magazine

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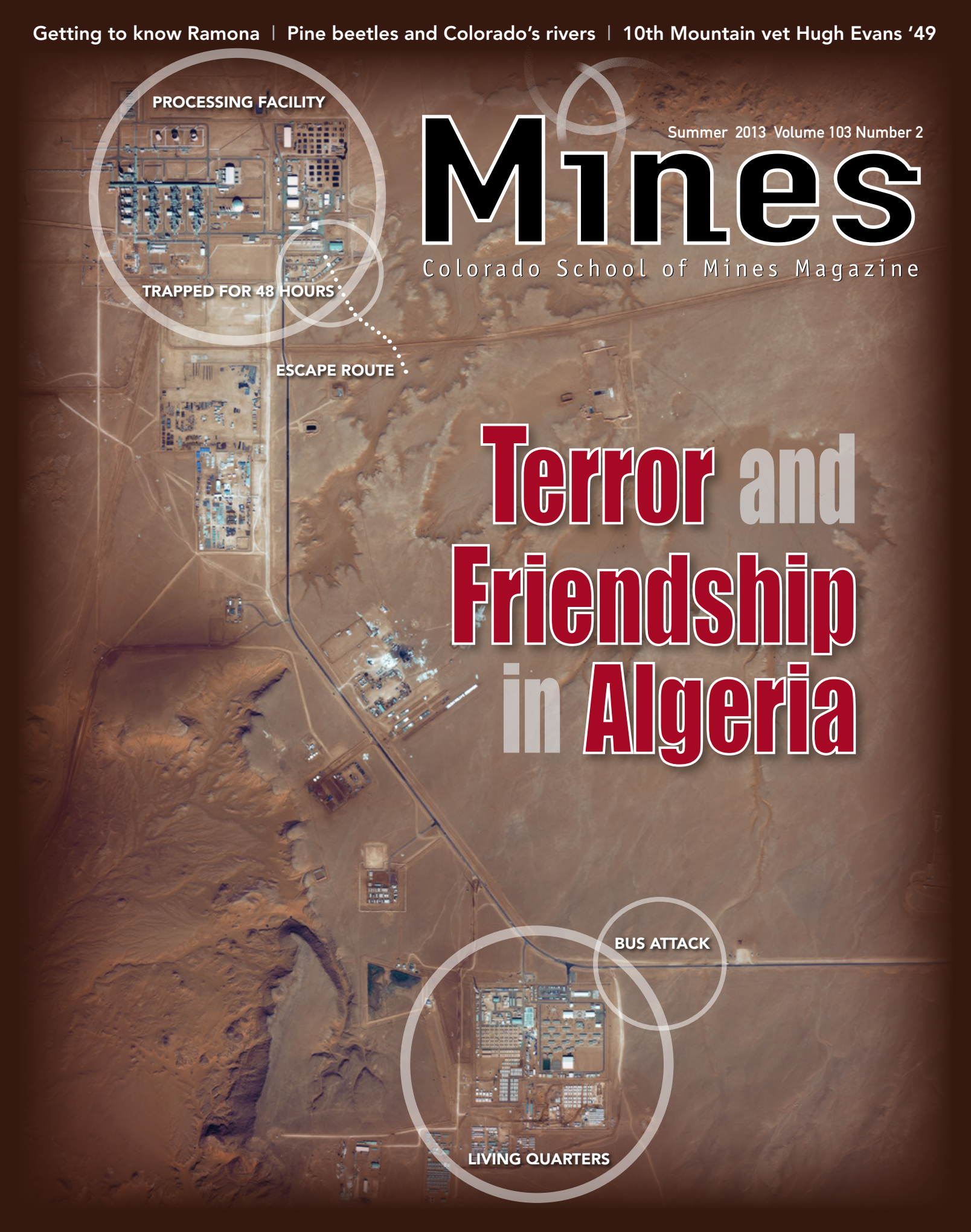
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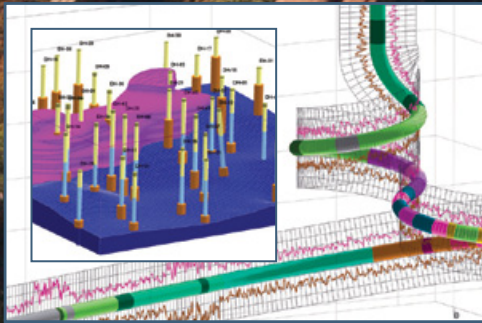
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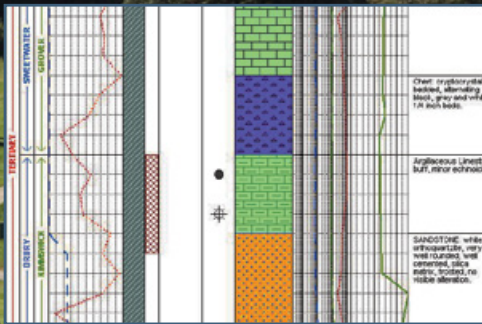
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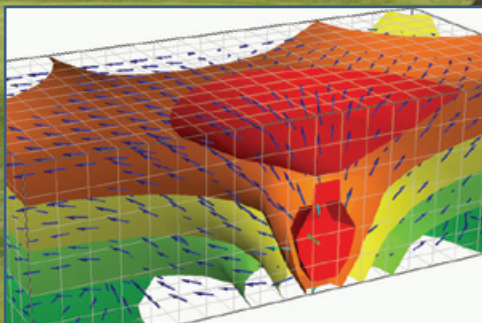
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Two Mines alumni and one former student were among those trapped by terrorists at the In Amenas gas plant in Algeria on January 16. They never expected to survive, but they did, thanks in part to the help and support they gave each other.

20 The Face of Petroleum Engineering

Ramona Graves PhD '82 was the second woman in the U.S. to earn a doctorate in petroleum engineering. After 30 years teaching at Mines, she is now dean of the newly formed College of Earth Resource Sciences and Engineering. Learn where this larger-than-life Miner grew up and her vision for the new college.



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Cosmic Rays Mines' physicists seek to decode messages from the most extreme regions of the universe

Dead Trees and Dirty Water When pine beetles kill forests, they also change river systems

Mountain Rescue in China Amber Moran '09 uses her Colorado experience to train with the Sichuan Mountaineering Team

Automated Chicken Farming in Saudi Arabia An intriguing project brings John Sulzbach '56 out of retirement

Alumni Weekend Gallery Look for your classmates

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JOE GRAY

I want to compliment you on the magazine's format and structure. I read it completely the day it arrives. Today our local telephone and Internet provider upgraded our Internet speed and now I will be reading it online as well.

Joe Gray [spring 2013, Inside Mines, p. 8] and I were classmates. I knew he was bound for greatness, but never expected he would end up in cancer research. I am a cancer survivor and have outlived all expectations of the medical staff at the University of Kansas Medical Center. The lack of any pituitary function has been a life-changing event and brought me into an understanding of what is most important in life.

Jim Gardner '68

LOYAL READERS WRITE

After I read the spring issue of the magazine, I passed it on to my father as I thought he'd enjoy some of the articles. When I talked to him earlier today, he thanked me profusely for sharing it with him. He not only enjoyed the articles I thought he'd be interested in, but also took great interest in some of the other features, and pretty much read the magazine from cover to cover.

My daddy is a retired farmer and a prolific reader, whose own college education was cut short by pressing family needs when he was that age. However, he does have three children, one grandson and a grandson-in-law with engineering degrees.

Here's to more great publications!

Connie Martin '73

Many thanks for sending me *Mines* magazine. I am not one of your alumni but wish I were! I read your magazine from cover to cover—always interesting articles, such as the recent “America Reenergized” [spring 2013]—truly a bonanza that will greatly help the economy as well as our balance of payments. I even read all of In Memoriam—a testament to the accomplishments of your graduates through the years.

Marjorie Eckman, future donor

Each issue is welcome. All are well done, interesting, the appropriate length, have appropriate variety and, obviously, subject to high internal standards. Thank you for your hard work and professionalism.

David Montague '71

CAMPUS JOBS

[Response to “The Best Gigs on Campus,” spring 2013] As a wrestler, there were only two scholarships, and they went to others, but we got jobs in the cafeteria. I went to Mines for eight semesters and never paid for meals except during summer school one year.

I also worked two summers in the oil fields of Kansas on pumping units. I never saw broken units like the ones shown on the cover. I enjoy the magazine.

Warren Harrison '67

Ed.: Yes, our designer exercised artistic license on the cover of the spring issue.

REMEMBRANCE

I worked for and with Tom [Howard '41, spring 2013, In Memoriam, p. 45] for almost 10 years developing innovative mining equipment, including a backfill system initially used in South African gold mines. He provided much of the technical direction and practical focus for the research and development efforts of Joy Manufacturing Hard Rock Mining Division. He encouraged the innovative use and modification of mining equipment to meet the needs of the mining and petroleum industries.

Roger Nielson '75

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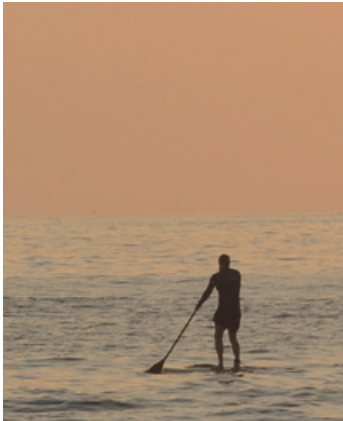
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Honoring and Supporting Our Own



For those working in the energy industry in unstable countries around the world, the risk of terrorism is a daily reality. Miners who have lived with such risk would have been particularly alarmed by news of the January 16 attack on the gas plant in In Amenas, Algeria. We were also concerned.

In the days following the violence, as the media released names of the casualties, we were somewhat relieved to find no alumni mentioned. Then on January 20, Michael Long '72, who had worked at the In Amenas facility 1998–2000, forwarded us an email from Greg Staff '73, linking to a Fox News article about the narrow escape of Steve Wysocki '85.

It was several weeks later that we finally spoke to Kristi Wysocki '84 and learned that not only had her husband been at the facility, but so had Nick Frazier '03 and former Mines student Christoph Zinner. She narrated the events in excruciating detail, having been in touch with Steve verbally and via text message from the first minutes of the attack. She added that all three were currently together in Oregon, attending a memorial service for their boss and colleague, Gordon Rowan, who was killed in the attack.

Imagining the horror of their experience, I came away from the call feeling a little overwhelmed; in the days that followed, this was replaced with a growing sense of responsibility to report their story in a compelling manner that honors their experiences without sensationalizing. I hope you'll agree that author Lisa Marshall achieves this precarious balance with remarkable skill.

After reading her article for the first time, I kept returning to something Frazier said: "No one can ever understand what it was like, and how you feel afterward, except the guys who were there. I'll be in touch with them for the rest of my life."

The words caught my attention because, in addition to pointing to the inseparable bonds that often exist between fellow survivors, he also references the isolation that trauma can create. It seems cruelly ironic that after deeply disturbing events, when the empathy of family, friends and community is most needed, it can be harder than ever to reconnect, because so few people can understand what the victims have gone through.

While we can't ever fully communicate the horror of the attack, we sincerely hope that our account goes some way toward expanding awareness of what these three individuals and their families have endured. We also hope that it provides an opportunity for the community to come together in a show of support. If you'd like to do this, one easy way is by going to minesmagazine.com/terrorandfriendship, where you can add your comments at the end of the story. You can also email us at magazine@mines.edu and we'll share your message as appropriate.

Thank you for taking the time to honor and support our own.

Nick Sutcliffe

Editor and Director of Communications
Colorado School of Mines Alumni Association

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MATERIAL RESEARCH

Material Diversity

How diverse is materials research at Mines these days? Read about these three high-profile programs, housed in different departments and spanning a wide spectrum of industries, and judge for yourself.

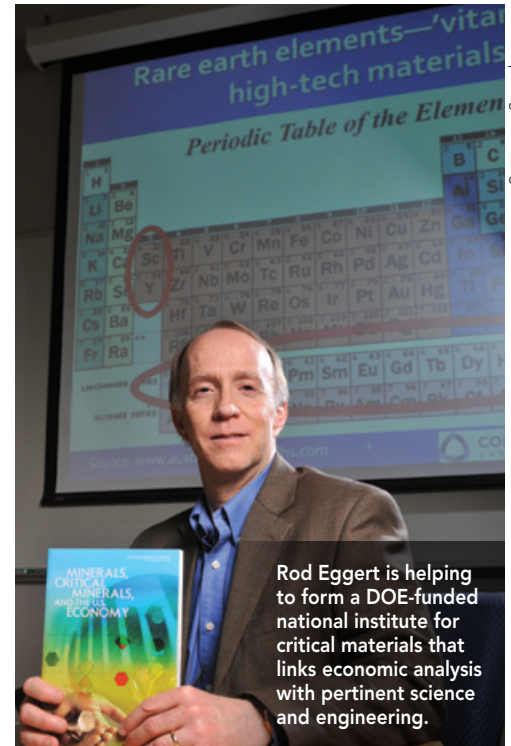
CRITICAL MATERIALS

Since chairing a National Research Council committee that led to an influential book on rare and critical minerals, Division of Economics and Business Director Rod Eggert has earned national and international respect as an authority on the subject, speaking to industry groups, the European Union in Brussels, Belgium, and more than one congressional committee. His latest project at Mines involves helping to lead the newly formed Critical Materials Institute for the U.S. Department of Energy.

“The elements of concern evolve and change over time,” Eggert says, explaining that industries are constantly searching for less expensive substitutes and new supplies. Mines is slated to receive almost \$14 million over five years to fund the institute, which will encompass the nuts-and-bolts science and engineering of critical minerals, as well as economic analysis. While this is certainly not new territory

for the university, linking economic analysis with science and engineering as a major partner of a high-profile national institute dedicated to an issue of such importance breaks new ground.

The new grant will more than double research related to critical materials at Mines, providing funding for perhaps 10 new graduate students. Other Mines faculty currently involved include Corby Anderson, Michael Kaufman, Barry Martin, Nigel Middleton, Brajendra Mishra, John Speer, Patrick Taylor '74, PhD '78 and Doug Way.



Rod Eggert is helping to form a DOE-funded national institute for critical materials that links economic analysis with pertinent science and engineering.

STEEL

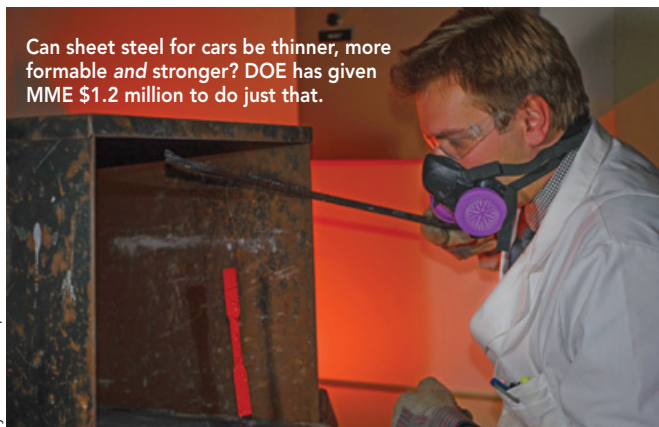
The auto industry has a major challenge to overcome in the next decade: In 2016, federal regulations require manufacturers to increase average fuel economy for cars from 29.7 to 35.5 mpg, and by 2025, the average for cars and light-duty trucks jumps to 54.5 mpg. While both require big changes, to meet the 2025 standard will require fundamental innovation.

One way to achieve greater fuel efficiency is by making

lighter cars, says Emmanuel De Moor, a research assistant professor with the Advanced Steel Processing and Products Research Center in the Department of Metallurgical and Materials Engineering. However, lighter can't mean flimsy; manufacturers need solutions that don't compromise occupant safety.

De Moor says this can be achieved by influencing the microstructure of sheet steel in a way that improves both formability and strength. That's the goal behind a \$1.2 million U.S. Department of Energy grant recently awarded to De Moor's team, which aims to develop processes for making a next-generation steel that, in addition to helping make more fuel-efficient cars, would require less energy to process because it can be stamped into auto body parts at room temperature. Hot stamping currently requires heating steel to 1,650 degrees Fahrenheit.

De Moor's team for this project includes several Mines faculty, students and alumni, including Professor Emeritus David Matlock, Professor John Speer, and Los Alamos National Laboratory scientists Amy Clarke MS '02, PhD '06 and Kester Clarke MS '02, PhD '08. DOE support is supplemented with private funding from AK Steel, General Motors, Nucor Steel, Severstal, Toyota and United States Steel.



Tyson Brown '08, MS '11

Tom Cooper Lightbox Images

LASER-DEPOSITED CERAMIC COATING

When scientists at Oak Ridge and Lawrence Livermore national laboratories needed a partner to help develop an unusually hard coating for tunnel boring equipment, it was natural they should turn to the Earth Mechanics Institute (EMI) at Colorado School of Mines. Since just about every major tunnel-boring project in the world relies on the institute for customized equipment specifications for their location, its expertise in testing rock boring equipment is unparalleled.

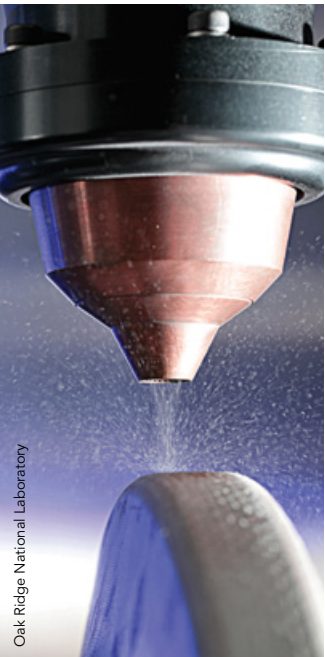
The unusual aspect of this collaboration is the material developed: an extremely resilient coating, similar to a ceramic, that is deposited on cutting edges using powerful lasers. Able to extend the life of cutting equipment by as much as 20 percent, NanoSHIELD (Nano Super Hard Inexpensive Laser Deposited) coating performed so well in tests that it was selected for a

prestigious R&D 100 Award in 2012, and R&D Magazine included it in a feature titled, “9 Materials That Will Change the Future of Manufacturing.”

Brian Asbury, who has worked on the program since it began in 2004, has headed up Mines’ involvement since 2010, when he took over from the former director, Levent Ozdemir ’73, MS ’75, PhD ’78. Funding was provided by the Defense Advanced Research Projects Agency and the DOE’s Loan Programs Office,

Office of Civilian Radioactive Waste Management, and Office of Energy Efficiency and Renewable Energy.

—Mica Ward and Nick Sutcliffe



Ultra-hard NanoSHIELD coating, which won an R&D 100 Award in 2012, was developed by Mines’ Earth Mechanics Institute and two national laboratories.

SPACE STUDY

Cosmic Messengers from the Extreme Universe

Ultra-high-energy cosmic rays (UHECRs) carry an unfathomable amount of energy—about 40 million times as much as the highest-energy protons produced in man-made particle accelerators. For decades, physicists have sought to understand more about them—particularly where they come from and what they are made of—but UHECRs are elusive; on average, fewer than one hits the Earth per square mile, per century. Lawrence Wiencke and Fred Sarazin, both associate professors of physics at Mines, have long been involved in the Pierre Auger Observatory in Argentina, which monitors UHECRs over a 1,200-square-mile area. Now, thanks to a \$1.7 million share of a \$4.4 million NASA grant, they are helping to establish an observatory in space, which will record about 100 times as many UHECRs as the South American facility.

Since UHECRs are subatomic and move at close to the speed of light, scientists don’t try to detect them moving through space. Instead, they interpret the shower of particles and electromagnetic radiation, and the accompanying track of ultraviolet fluorescent light created when an UHECR plows into the atmosphere.

This new initiative, called the The Extreme Universe Space Observatory on board the Japanese Experiment Module (JEM-EUSO), uses the track of UV light to determine an UHECR’s energy and trajectory through space. However, calibrating the track of UV light is a challenge, since it is influenced by constantly changing atmospheric conditions.

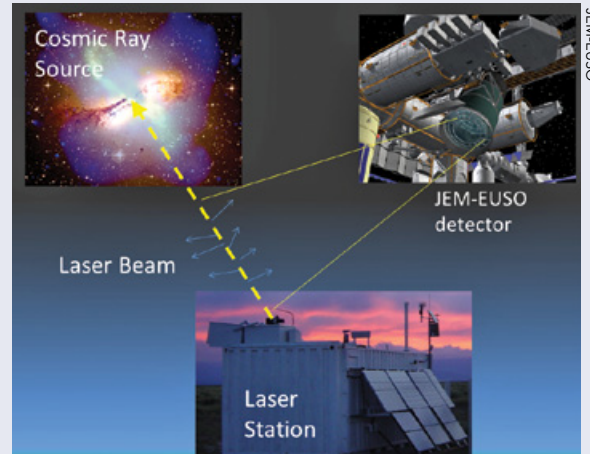
That’s where the Mines team is making an important contribution. Wiencke and Sarazin are designing a ground-based network of flashing lights and UV lasers to provide a benchmark for the UV light detected in space. “The Global Light System (GLS) locations need to be representative of the different climates around the world, because the way the atmosphere reacts to the impact of cosmic rays depends upon the general properties of the atmosphere where they occur,” explains Sarazin.

By plotting the variations in light detected in space from identically calibrated light sources situated in a wide range of climates around the globe, scientists can better correct for atmospheric variability when interpreting UV light detected in space from an UHECR. Similarly, UV light detected from a UV laser beam with a known trajectory gives scientists a way to refine their interpretations of an UHECR’s path through space. While there’s a big difference between light from a ground-based laser beam and the UV track created by an UHECR, Wiencke says the variability is similar.

Assisted by partners at the Marshall Space Flight Center and the University of Alabama in Huntsville, the Mines team will select suitable locations and develop, install and maintain laser stations for the GLS array.

In all, 13 countries, 77 institutions and about 280 researchers are helping prepare for the telescope’s ultimate deployment, currently scheduled for 2017. In addition to those previously mentioned, U.S. partners include the University of Chicago, the University of Wisconsin-Milwaukee and Vanderbilt University.

—Nick Sutcliffe



Global Light System locations (identified as a laser station here) provide a benchmark for the space-based telescope used to detect high-energy cosmic rays.



Watch a video about the Mines physics department, and learn more about this program at minesmagazine.com/jem-euso.

COMPUTATIONAL RESEARCH

Mines' New Boulder-Based Supercomputer

Colorado School of Mines' new 155-teraflop supercomputer, dubbed "BlueM," will allow researchers to run large simulations that support the university's core research areas while developing innovative algorithms to make the best use of a powerful hybrid system.

Although BlueM will be housed at the Boulder-based National Center for Atmospheric Research (NCAR) as part of a new collaboration, it will be part of the Mines network, and faculty will have broad access. "Most large-scale, high-performance computing systems available for academic research are available under the NSF XSEDE [National Science Foundation Extreme Science and Engineering Discovery Environment] program," says Timothy Kaiser, director of research and high-performance computing at Mines and the director of Golden Energy Computing Organization. "Machines might be on a

college campus, but the home institution only has access to about 7 to 10 percent of the capacity. The rest is used by general NSF researchers. Because BlueM belongs to Mines, we get to decide how it's used."

Once the switch is thrown on BlueM, there's a long and diverse list of projects waiting to be run. Subjects to be researched include biomass conversion and the stability of biomass fuels, fuel cells, fundamental

battery technology, hydrate nucleation, wind energy, hydropower, carbon sequestration, fission reactor design, environmental impact of pine beetle infestations (see story, p. 12), atmospheric scattering affecting climate, interactions between surface and groundwater, seismic modeling, solar cells, and nanostructures and nanowires in solar cells.

While Mines has outgrown BlueM's 23-teraflop predecessor, RA, the supercomputer was extremely successful at promoting computational research at Mines, creating an appetite that exceeded its own capacity. Able to operate at six times the speed, BlueM performs 155 trillion operations per second. This allows researchers to run higher-fidelity simulations than in the past, and, thanks to a first-of-its-kind, dual-architecture system that combines the IBM BlueGene Q and iDataplex platforms, they are likely to break new ground in terms of algorithm development. The two computer partitions are optimized for different calculations, so Mines and NCAR will conduct research on ways to combine them to perform multi-physics modeling, mostly focused on climate and the earth.

—Karen Gilbert


BlueM TECHNICAL SPECS

- Requires only 85 kW of electrical power
- Occupies a 20-by-8-foot footprint
- Comprises five racks (three compute racks, a management rack and a file system rack)
- Includes two partitions: MC2 (pronounced "Energy") runs on an IBM Blue GeneQ and AuN (pronounced "Golden") is based on the IBM iDataplex platform
- 155 teraflops (more than 104 in MC2 and 50 in AuN)
- 17.4 terabytes of memory, 10,496 cores in 656 nodes and 480 terabytes of disk
- Water-cooled



Chelsea Panos

WOMEN MINERS TAKE FIRST Over five days in March, mining teams from around the world came to the Mines campus to compete in the 35th Annual International Intercollegiate Mining Games. The Mines women's team won first place out of three teams; the two men's teams placed seventh and 13th out of a field of 18.

 You can read about the origins of the event and last year's victory for the co-ed team at minesmagazine.com/iimg2012.



COMMENCEMENT RECORDS

On May 11, 2013, Mines graduated the largest class in its history (16 percent more than the next-largest class) and awarded more degrees to women than ever before. Here are a few of the numbers:

Total undergraduate degrees:
706 (160 women)

Master's degrees:
191 (58 women)

Doctorates:
41 (13 women)

Starting salaries for two bachelor's degree recipients were the highest ever, at
\$115,000.

Nick Suediffe

STUDENT VOICE

McBride Honors Students Tackle Challenges in Activism and Water

“Today I want to tell you two stories,” said John Michael Angle, as he stepped up to the podium. “One is about water; the other about activism.”

So began the winning presentation by the Mines team at the first annual Rocky Mountain Honors Symposium, hosted at Mines in April by the McBride Honors Program in Public Affairs.

At first, the other McBride students and I who had collaborated with Angle on the project looked on anxiously. But as Angle hit his stride, we relaxed—the sophomore mechanical engineering major who hails from Mississippi and coaches a high school debate team was clearly not going to let us down.

The objective of the event was to bring together teams of honors students from across the Front Range to deliver presentations about pressing environmental challenges. Using a collaborative voting system, competitors picked which team delivered the most compelling presentation.

In our first meeting, our group decided not just to talk about change; we wanted to make a change happen right here on the Mines campus.

Our goal: Cultivate support for incorporating grey water reuse into future building projects at Mines, and develop a concrete plan for implementing a grey water system. Grey water refers to water collected from showers and laundry facilities, which has low levels of contaminants and is suitable for reuse in non-potable applications like irrigation and toilet flushing. Our survey demonstrated that 95 percent of those knowledgeable about grey water systems approved of their use.

While we were unable to establish firm plans for implementing a grey water system, we were successful in other respects. After speaking with key departments on campus, the city of Golden and President Scoggins, we ultimately obtained a commitment that future building projects at Mines would include studying the feasibility of incorporating grey water reuse systems.



The winning Rocky Mountain Honors Symposium team from Mines included (left to right) Katie Huckfeldt, Bradley Wilson, John Michael Angle, Alec Thompson, Lucy Orsi and Katie Williams. Channeling Nixon behind the group is McBride Honors Program Director Ken Osgood.

With this part of our goal achieved, we went to work developing a presentation that conveyed both the practicality of grey water reuse and the lessons in engineering and activism that we learned as part of the project.

AWARDING THROUGH CONSENSUS

Our competition at the symposium was tough. More than 100 honors students from eight Colorado universities—from Pueblo to Fort Collins—came prepared with excellent presentations that addressed such challenges as food overproduction, wildfire prevention and wasteful electronics design.

The winning presentation was selected by a vote, but there was a unique twist. At the beginning of the day, we had been seated at tables with students from other schools. With the help of a few icebreakers—including a photo scavenger hunt that sent groups of students wandering around Golden, taking pictures in front of the mortuary or handcuffed in front of police cars—groups quickly gelled. Then,

after all presentations were concluded, each table cast one vote, forcing us to discuss and evaluate each other's presentations together. When our team was announced the winner, we walked onto the stage to Queen's “We are the Champions,” with the audience cheering loudly. Every table had voted for us; it was a great moment.

“All the presentations were amazing,” says Ken Osgood, director of the McBride Honors Program, “but what made the Mines project stand out was that the students didn't just communicate a challenge; they sought a solution here on our campus.” Although we didn't accomplish everything that we originally set out to do, we laid the foundation for a progressive shift in construction planning. We made the case that grey water reuse is both doable and desirable. We also learned that making a difference requires slow, patient and persistent work.

—Katie Huckfeldt '13

Katie is now an environmental engineer with QEP Resources in Denver.

WATER RESEARCH

Modeling a Beetle's Impact on Water Systems

It's no secret that mountain pine beetles have ravaged the lodgepole pine forests of Colorado and the Intermountain West. Take a hike in Summit County, for example, and the reddening, dying or dead trees are everywhere, their trunks pock-marked with blond sap pustules left behind by the beetles. Scientists predict that 95 percent of mature lodgepole pines in Colorado will ultimately die.

These huge stands of dead lodgepole have raised widespread concern about fire; however, few have considered the impact on another element of nature that is of vital importance to Westerners—water.

Reed Maxwell, an associate professor of geology and geological engineering at Mines, has wondered about it a lot. In particular, he's concerned about the effect the lodgepole massacre will have on the headwaters of the Colorado and South Platte rivers, systems that together provide water to 90 million people. The amount of water flow—and its quality—will change. "It's a land cover change we haven't seen before," he says.

Maxwell, a member of the Hydrologic Science and Engineering (HSE) program at Mines, was recently awarded a \$3 million National Science Foundation grant to model the effects of the pine beetle infestation on water in Colorado over the next five years.

To answer questions about the effect of the dying trees, Maxwell and his team are creating a custom version of a hydrologic model that he helped develop. ParFlow, as it is called, will be applied to the entire headwaters of the South Platte—north-eastern Colorado, the Front Range and South Park—and the headwaters of the Colorado River in north central Colorado.

With information about the vegetation, relief and geology of the area, the model uses scientifically based assumptions for how streams flow, groundwater percolates, plants draw and release water, and water moves between earth and sky, to predict outcomes that reflect the real world.

A HYDROLOGY PROGRAM

Hydrologic modeling isn't the only way in which Colorado School of Mines is involved in hydrologic research. Members of the HSE Program—25 faculty from geology and geologic engineering, civil and environmental engineering, geophysics, and chemistry, as well as 50 graduate students—are involved in everything from

aqueous geochemistry to contaminant remediation to water policy and law.

Nor is the pine beetle project the only way in which ParFlow has played a starring role. Recently, it was plugged into the land surface model of the National Center for Atmospheric Research's Weather Research and Forecasting model (WRF—pronounced "warf"). This model has 10,000 users worldwide and makes up a part of nearly every weather forecast in the United States.

Prior to ParFlow's inclusion, WRF relied on a less sophisticated system for modeling surface water. Luca Delle Monache, a project scientist at NCAR, points out that often water people tend to focus on land systems, and atmospheric people tend to focus on air, but Maxwell "created a tool that is the perfect instrument to get those two communities to interact with one another."

In the future, Maxwell hopes to further use hydrologic modeling to answer

practical questions in yet more systems. For example, he's begun work on a hydrologic model of Denver's Cherry Creek, which has experienced a 568 percent increase in paved land and a 98 percent decrease in agriculture in the last six years—one of the most rapidly urbanizing watersheds he's ever seen.

Asking and answering questions that concern these kinds of hydrological interfaces is what Maxwell and the HSE program are especially well suited for, he says. "Because of Mines' history, we have a strong quantitative focus," says Maxwell, "and the earth, science and environment intersection has made it a great place to build a hydrology program."

—Jennifer Frazer



Above Reed Maxwell
Below Lindsay Bearup samples water in an area infested with pine beetles.



Tom Cooper Lightbox Images



Watch an NBC video of Maxwell's work at minesmagazine.com/pinebeetle.

MEDICAL RESEARCH

Mines Teams with Children's Hospital

Some day children with growth plate injuries could avoid deformities, children with cystic fibrosis could have better treatments, and children with birth defects could grow new bone, thanks to a new collaboration between the Colorado School of Mines Office of Research and Technology Transfer and the Children's Hospital Colorado Research Institute.

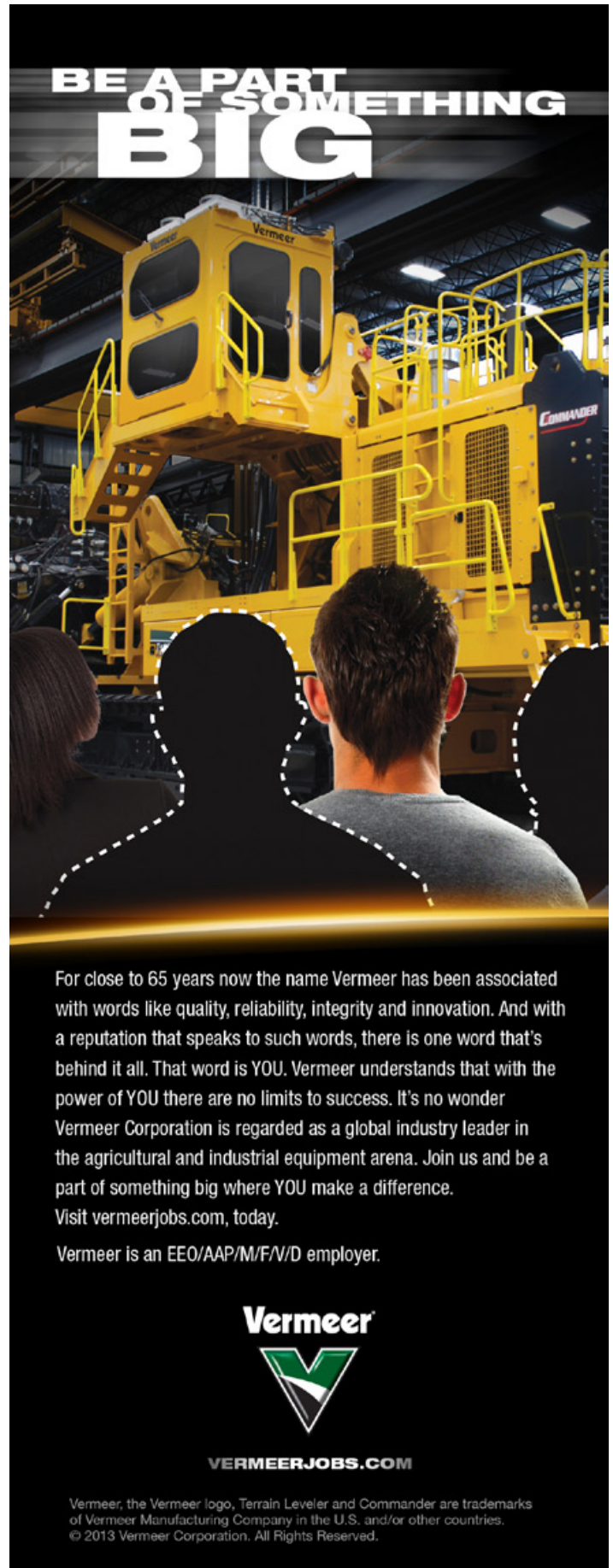
Launched in early 2013, the co-funded Children's Hospital Colorado—University of Colorado/Colorado School of Mines Collaboration Pilot Awards provide seed grants of up to \$20,000 to promote teamwork and generate preliminary data for larger grants from the National Institutes of Health. In March, the first recipients of these seed grants were announced:

Melissa Krebs, an assistant professor of chemical and biological engineering at Mines, and Karin Payne, an assistant professor of orthopedics at the University of Colorado Denver, are developing an injectible, sustained-release biomaterial system to promote normal healing of growth plate injuries. The growth plate is a region of cartilage at the end of children's bones that provides the signals for lengthening as children grow. However, trauma to the growth plate can cause abnormalities and uneven growth. Krebs and Payne are developing a means of depositing growth factors at an injury site that could heal such injuries before they cause abnormal growth. Krebs' role is designing a delivery system—a hydrogel containing tiny, biodegradable polymer microspheres that carry growth factors. She envisions how it might one day be used: "The patient comes in and is diagnosed with a growth plate injury and the physician can take a ready-to-go syringe out of the fridge and inject it."

Keith Neeves, assistant professor of chemical and biological engineering at Mines, will team up with Shama Ahmad, a pediatrics researcher at the University of Colorado, to study cystic fibrosis (CF) by creating "lungs on a chip," made up of tiny pathways colonized with cells—some chips with healthy lung cells and some with lung cells from CF patients. Tiny plugs of mucus passing through the chips will simulate the excessive coughing of CF patients, which can damage lung cells and inhibit breathing. Ultimately, Neeves' "microsystem-based" lung models will be used to test new CF treatments.

Steve Boyes, associate professor of chemistry at Mines, and Sven-Olrik Streubel, an otolaryngologist from Children's, are developing next-generation polymer scaffolds, upon which to grow new bone. Doctors have traditionally used bone from other regions of the body, or from cadavers, to repair malformations. As an alternative, Boyes' lab is working on a strong, moldable polymer scaffold, infused with peptides and bone growth factors, that eventually biodegrades, leaving healthy bone in its place. "It's a long way off," he stresses. "But in children with congenital birth defects in their jaw, we could take a mold of what the surgeon wants to put in there, design a polymer to look like that mold and implant it so it grows bone, and they could grow a normal facial structure."


—Lisa Marshall



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SPORTS

Highest Year-End Learfield Ranking in School History

The Colorado School of Mines Department of Athletics finished with a school-record, 10th-place finish out of 290 NCAA Division II institutions in the 2012–2013 Learfield Sports Directors' Cup Standings. The Oregidgers have now finished in the top 25 of the standings for four consecutive seasons. Contributing to this victory were three RMAC Tournament titles and two RMAC regular season titles, as well as 23 All-Americans. In all, 13 of Mines' 18 sports teams qualified for their respective NCAA tournament or championship.

SOFTBALL. The softball team captured both the RMAC Regular Season and Tournament Championships for the first time in program history, posting a school-record 40 victories (40-7-1) en route to its third appearance in the NCAA tournament in five seasons.



Alexander Dawson School

David Hansburg

NEW ATHLETICS DIRECTOR.

As of August 1, Mines will have a new director of athletics.

David Hansburg comes to Mines from Alexander Dawson School in Lafayette, Colo., where he directed the athletics program for two years. Prior to that, he served as associate athletic director for football operations and summer camps at the University of Colorado Boulder, having held similar positions at Northwestern University and the University of Idaho in Moscow. Hansburg relieves Marv Kay,

who returned to his former office for four months as interim director after a 10-year absence—Kay was Mines' director of athletics 1994–2003 and head football coach 1970–1994.

—Colin Bonnicksen

MME VICTORY The Mines Metallurgical and Materials Engineering team won the 2013 Materials Bowl competition for the second year in a row. The players included (left to right) graduate students Greg Lehnhoff '09 and Ellen Verkler '12, graduating senior Liz Hunter '13 and undergraduate Paul Wilson.



The Minerals, Metals & Materials Society (TMS)

IN BRIEF

The **Mines Mine Rescue Team** won third place in the Men's Field Competition, beating eight professional industry rescue teams, during the Nevada Mine Rescue Contest held in the spring.

Tina Gianquitto, a research associate professor in the Division of Liberal Arts and International Studies (LAIS), was awarded Best Paper (general, non-student) by the Society for the Study of American Women Writers.

College of Applied Science and Engineering Dean **Tony Dean** was awarded the American Chemical Society Colorado Section Award for 2012.

Professor Emeritus **Arthur Kidnay** is the 27th recipient of the Gas Processor Association's prestigious Katz Award.

The Mines chapter of the **Society of Physics Students** was selected as an Outstanding SPS Chapter for 2011–2012.

Mines student **Riya Muckom** has been awarded the National Science Foundation's Graduate Research Fellowship.

The Chemical Engineering Division of the American Society for Engineering Education gave its 2013 Raymond W. Fahien Award to **Matthew Liberatore**, an associate professor in the Department of Chemical and Biological Engineering.

Professors **Tom Davis**, **Bruce Honeyman** and **Azra Tutuncu** were named to the Hydraulic Fracturing Research Advisory Panel of the U.S. Environmental Protection Agency's Science Advisory Board.

Chemistry and Geochemistry Associate Professor **Bettina Voelker** published "Widespread Production of Extracellular Superoxide by Heterotrophic Bacteria" in the May 2, 2013, edition of Science magazine.

Kathleen Hancock, an associate professor in LAIS, was recently published in International Studies Perspectives for her article, "Women and Pre-Tenure Scholarly Productivity in International Studies: An Investigation into the Leaky Career Pipeline."

The National Association of Graduate-Professional Students named Mines' Graduate Student Association the 2012 Member of the Year and 2012 Western Regional Member of the Year. **Zach Aman** '09, MS '11, PhD '12 was honored as 2012 Individual Member of the Year.

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Terror and Friendship in Algeria

How three individuals, linked by their common experience at Mines, supported each other through the most terrifying ordeal of their lives

By Lisa Marshall

The first rounds hit the bus with a deafening bang, prompting Nick Frazier '03 to assume with annoyance that a tire had blown and his errands in the nearby town of In Amenas, Algeria, would be delayed. Glancing out of the window, he saw a blur of red streaks piercing the dark desert sky. When the glass around him started shattering, the reality of his situation broke through: The bus was under attack.

With the 11 other passengers already scrambling to lie flat in the aisles, he squeezed into a tight stairwell and began tapping out a carefully worded text message to his wife back home: "Call U.S. embassy. Bus under attack." He would spend the next 3 hours crouched there, still and silent, as Al Qaeda militants showered the vehicle in gunfire and launched at least one rocket-propelled grenade.

"I didn't want to give in or let go of hope," recalls 33-year-old Frazier.

The pre-dawn bus attack at the In Amenas gas facility on January 16, 2013, was just the beginning of a bloody four-day kidnapping siege that would leave 37 foreign workers—including three Americans—dead, and shine a glaring light on security issues in politically volatile areas where many petroleum engineers work. Two Colorado School of Mines alumni—Frazier and Steve Wysocki '85—and one former Mines exchange student, Christoph Zinner, survived by working together, sharing information and planning their escape. Tragically, they would lose several close friends, including their boss, Gordon Rowan.

Now, safely home, they say their views about their jobs, and each other, will never be the same. "No one can ever understand what it was like, and how you feel afterward, except the guys who were there," says Frazier. "I'll be in touch with them for the rest of my life."

FROM THE COLORADO MOUNTAINS TO THE ALGERIAN DESERT

Wysocki, Zinner and Frazier never knew each other at Mines. But their common love of adventure and knack at problem solving would throw them together in 2012 on a tight-knit team of eight well-intervention specialists on a desolate patch of sand 5,000 miles from Golden.

The son of a petroleum engineer, Frazier grew up in Alaska and traveled the globe with his family, cultivating a wanderlust that prompted him to follow his father into the energy industry. After several years of working an office job in Alaska, he looked for an international posting that—with good pay and a four-weeks-on, four-weeks-off schedule—would allow him more time to travel with his wife, Melissa, and, later, his son, Austin.

The first opportunity that arose was at the In Amenas gas facility,

a joint venture between BP, Statoil and the state-run Algerian oil company, Sonatrach. He knew the region was volatile and that violent attacks against ex-pat oil workers were not unheard of—in 1994, kidnappers executed two Schlumberger employees at a Sonatrach site. "I called a couple of guys who had been to Algeria before and they said, 'It sounds scary but nothing has happened there in a long time,'" recalls Frazier, who took the job with BP in 2008. By 2012, he had climbed the ranks to senior petroleum engineer.

In March, 2012, Wysocki joined Frazier's team.

A friendly, down-to-earth guy who grew up in the small towns of Colorado, Wysocki had first worked in Algeria in 1997. "This is a part of the world I would probably never go to otherwise," recalls Wysocki, now 58. "It was a whole different set of challenges and that really interested me."

He worked at various sites before "trying to retire" in 2006 so he

MINERS IN ALGERIA

Three individuals with close ties to Mines were at the In Amenas gas plant when the terrorist attack began on January 16, 2013.



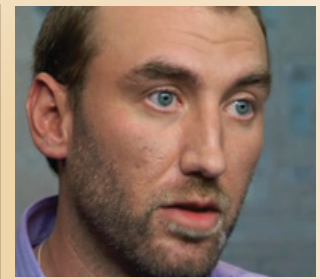
Steve Wysocki '85
(pictured with his wife, Kristi Wysocki '84)

Contractor, petroleum engineering
First in Algeria in 1997; returned in 2008
Location during attack: Office; hid under desk
Escape: With Zinner and a third employee, early on the third morning, he escaped through a hole in the perimeter fence and ran across the sand to Algerian military.



Christoph Zinner
36, Austrian

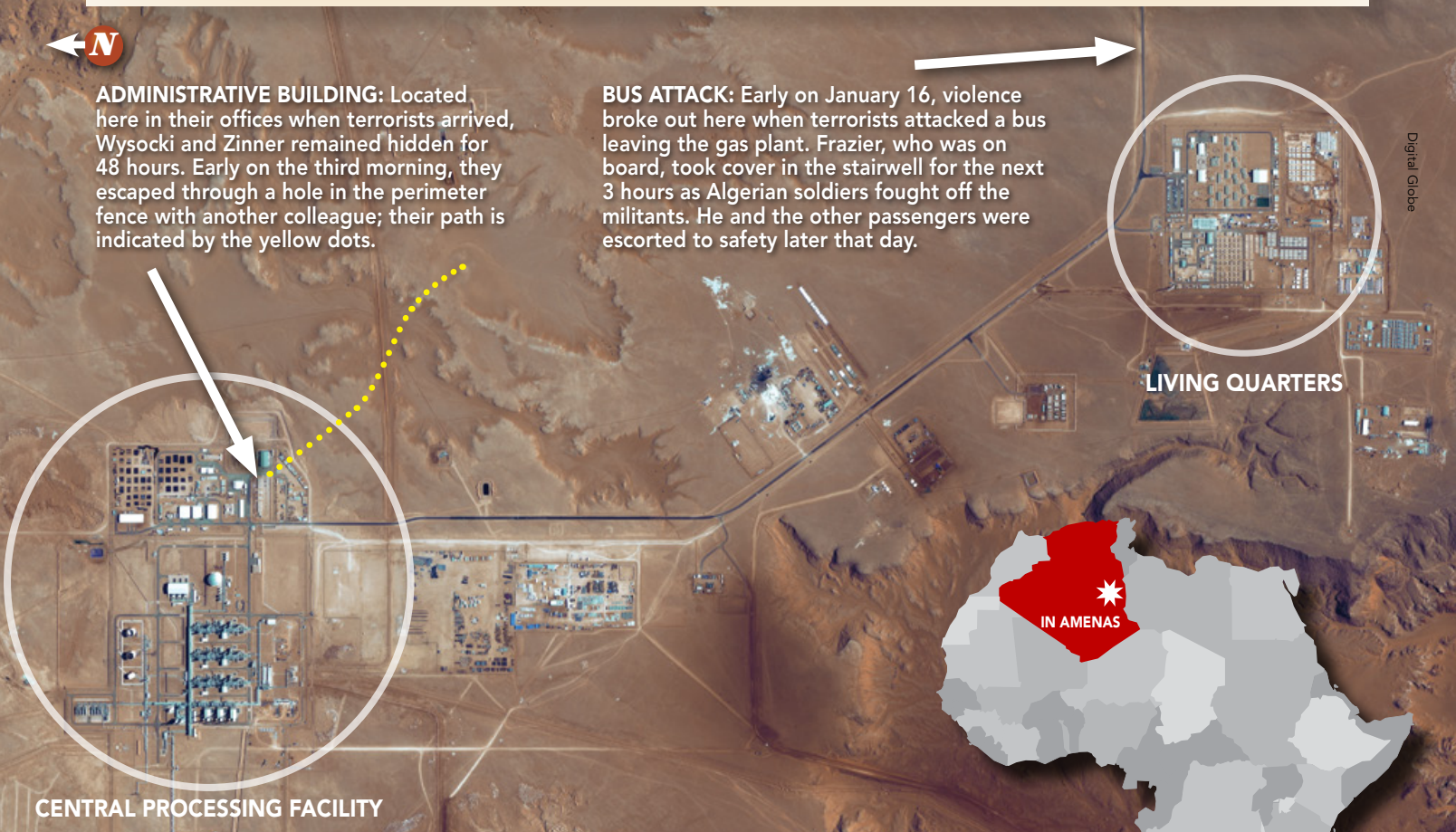
In Algeria since 2007
Location during attack: Office; hid under desk
Escape: With Wysocki and a third employee, early on the third morning, he escaped through a hole in the perimeter fence and ran across the sand to Algerian military.



Nick Frazier '03

Senior petroleum engineer at BP
In Algeria since 2008
Location during attack: On a bus leaving the main gate of the gas plant.
Rescue: Algerian military escorted to safety on first day.

60minutes.com



ADMINISTRATIVE BUILDING: Located here in their offices when terrorists arrived, Wysocki and Zinner remained hidden for 48 hours. Early on the third morning, they escaped through a hole in the perimeter fence with another colleague; their path is indicated by the yellow dots.

BUS ATTACK: Early on January 16, violence broke out here when terrorists attacked a bus leaving the gas plant. Frazier, who was on board, took cover in the stairwell for the next 3 hours as Algerian soldiers fought off the militants. He and the other passengers were escorted to safety later that day.

LIVING QUARTERS

CENTRAL PROCESSING FACILITY

could spend more time on his wooded 77-acre Somewhere Farms in Elbert, Colo., where he and his wife raise horses. A year later, his former boss offered him a one-year job as a contract worker at another Algerian oil field. That turned into four years, and eventually landed him at In Amenas.

Zinner, a soft-spoken, 36-year-old Austrian, also arrived at In Amenas in 2012, after working for five years at other Algerian sites.

The compound is remote, with the residential camp spread out across a half square mile of wind-ripped desert, and an office complex and gas processing facility a short drive away. Roughly 700 people live there, including Algerian staff.

The 60 or so foreign workers onsite got to

Digital Globe

know each other well, working sun-up to sundown and gathering for poker games and movies in the evenings. Longtime friends Rowan and Wysocki met most evenings to take a brisk walk around the perimeter of the compound.

“You share family stories and talk about vacations and goals,” says Frazier. “These people become your family.”

When the engineers drove their vehicles out to work on wells, or got on a bus to leave the compound, they were accompanied by an armed military escort. Civilian gate guards controlled access to the facilities and camps, and the Algerian gendarmes lived in a camp 600 meters from the compound. But some saw a contrast between the security at this plant and elsewhere in Algeria. “Security was poor, not to the required standard,” said one unnamed employee of the plant in a recent New York Times interview.

In the six months prior to the attack, the In Amenas region had been rocked by intermittent worker strikes and, according to some who worked there, experienced “minor security breaches.” Two months before the attack, Frazier made a point to ask his wife to put the number for the U.S. Embassy in her phone.

“I didn’t realize it at the time, but subconsciously, I must have been concerned,” he says.

ATTACK

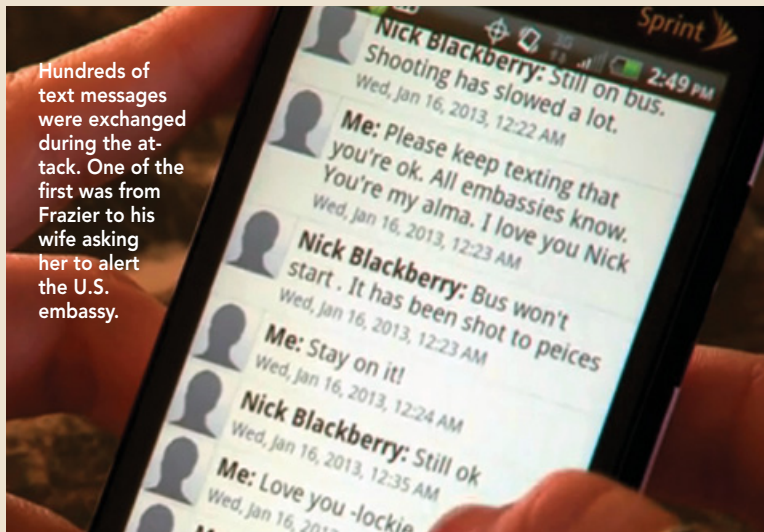
At around 5:45 a.m. on January 16, Wysocki was in his office near the gas production facility, talking to his wife, Kristi (Lofgren) ’84, back in Colorado, when the lights went out and the phone went dead. He called her back. “Power outage,” he explained. Before he hung up, sirens began to go off around the plant. Kristi, whose Mines degree is in metallurgical engineering, had worked for years at Prudhoe Bay, Alaska, before retiring to become a professional horse trainer. She wasn’t alarmed. “Things can go wrong in the oil field,” she says.

Soon after the two hung up, a group of workers came running up to the steps of his office. They thought they had heard gunshots from the direction of the Base Camp. “But we were all sort of in the mode of ‘this can’t really be happening,’” Wysocki painfully recalls on a recent evening at his Colorado ranch.

Soon, Wysocki, Zinner, Rowan and other colleagues began to hear militants speaking in Arabic on company walkie-talkies. When they contacted Frazier by phone, they learned the bus was under attack.

They immediately prepared hiding places, locked the door and waited.

After a few quiet hours, Wysocki saw an intruder clad in camouflage fatigues and a black headscarf walking toward their building, where he was standing just inside the door. As he ran back to his office, he raised the alarm to the others before crawling under his desk just feet from where Zinner was already hidden.



Hundreds of text messages were exchanged during the attack. One of the first was from Frazier to his wife asking her to alert the U.S. embassy.

They listened in horror as, nearby, their friend and boss, Rowan, was questioned by the terrorists, who were now in the building. A still-shaken Wysocki recites the exchange word for word: “He said, ‘I am Gordon Rowan and I am an American,’ to which they responded, ‘Then, you are welcome.’” A little while later they took Rowan and another hostage to a car and drove off.

Wysocki and Zinner curled up on the cold floor, where they would remain all day and night without food and water.

TEXTS AND TEAMWORK

From beneath the desk, Wysocki sent a single-line text to his wife, Kristi:

“I love you. Bad problems. Will call later.”

It was 1 a.m. in Colorado, when the text woke Kristi up. She read her phone in disbelief.

She texted back: “What does this mean?”

He responded: “Terror attack. OK now. Will try to call later.”

“There was probably about 10 seconds of me thinking my world was ending, but then I decided it was not going to help him if I panicked,” recalls Kristi.

She immediately started making phone calls, alerting BP in London and the U.S. State Department. She contacted Nick’s wife, Melissa, to see what she knew. After learning that—due to the flurry of urgent texts being sent among the workers hiding in the gas plant—Steve and his co-workers were about to reach their limit on text messaging, she alerted the FBI, who made sure that didn’t happen.

“In all the years since I graduated from Mines, I have never put my problem-solving skills to the test more than I did during those three days,” says Kristi. “My whole education was about how to focus on the problem and deal with the problem. I never thought I would use it the way I did. I believe the guys’ education from Mines also played a significant role in how they managed to get through this. They were amazingly level-headed.”

RESCUE

Inside the bus at the vehicle checkpoint, the gunfire had begun to subside. “Gunfire is lessening and much farther away,” Frazier texted his wife at around 6:15 a.m.

Passengers quietly assessed the injuries: two gunshot wounds, no fatalities. Somehow, the Algerian military had been able to fend off the attackers. They tried to start the bus, assuming they would drive it back to the camp. Fortunately, it didn’t start. “If we had gotten it started and driven it back to the base, I have no doubt that we would have been captured,” Frazier says.

But after an hour of waiting for the military to come get them, he began to hear shots again, “like when it rains, and you start to hear

a few drops, and then more and more, and then it is pouring.”

Then, “as if someone flipped a light switch,” it stopped.

Three military vehicles pulled up to the bus and ordered the passengers, one by one, to climb out the window and jump the 8 feet to the ground (Frazier crushed his knee in the process). They crawled across the desert floor and hid behind a military convoy, doing what they could for their wounded as they waited for their Algerian rescuers to escort them to safety. One man in their military escort vehicle had been shot in the head while trying to protect them.

“It was a miracle that we lived,” recalls Frazier. “I think the reason that they stopped firing was because they thought we were all dead. If the bullets would have penetrated the side of that bus, we would have been.”

Elsewhere, the ordeal was far from over.

THE ESCAPE

Zinner and Wysocki hid inside the office complex for two days, along with a half-dozen other colleagues spread out around the buildings, as unspeakable violence unfolded across the plant grounds and camps.

Some were shot execution-style. Others were strapped to bombs. Several are believed to have died in friendly fire, when the Algerian military fired upon a convoy of militants who—unbeknownst to them—were transporting hostages.

“I could hear heavy gunfire and explosions,” recalls Zinner, who remained in the same spot, under the desk, for more than 48 hours. “It was my hope and intention to survive. It was just a matter of finding the right time to come out.”

Early during the attack, the militants returned to look for more hostages. In the darkness, they kicked at the desks near Wysocki’s head. “I would be shaking and shivering because of the cold, but I found that I could just stop it,” he recalls. “It was just this cold fear.”

Until the cell system went down several hours after the attack began, texts were exchanged between Frazier (now safe in the hands of the Algerian military), Wysocki, Zinner and other colleagues, updating each other on the situation across the complex. “Terrorists are taking hostages,” Frazier texted. “Must stay hidden.” Meanwhile, Frazier drew maps for the soldiers, pinpointing where his friends were hiding so the military didn’t inadvertently attack them.

“Zinner and I thought we had been in there three nights, but it was only two,” recalls Wysocki. “Time really changed shape.”

On the third morning, they knew it was time to make a move.

“During the second night, the terrorists were looking for us, and if they had found us, we would be dead. I am convinced of that,” Wysocki says.

Clad in company coveralls to clearly identify themselves as workers and carrying white flags to wave should they come upon the military, Wysocki, Zinner and a third employee slipped out the door at the first glow of daylight and made their way toward the fenced



In February, Frazier, Wysocki, Zinner and several of their colleagues from the Algerian gas facility attended a memorial service for Gordon Rowan in Baker City, Oregon.

perimeter of the plant.

“The scariest part was crossing the parking lot because it was wide open,” recalls Wysocki.

They slipped through a hole in the fence and set out, half-running, across the sand. After maybe 20 minutes, they heard a voice in front of them shout, “Stop!”

Raising their white flags, they walked slowly forward into the hands of the Algerian military.

THE AFTERMATH

News outlets would later report that the Al Qaeda militants had planned to evacuate all the Algerian nationals and then blow up the plant, killing every foreign worker onsite. That plan was not carried out, due in part to two acts: An Algerian worker sounded the alarm at the onset of the violence (he was executed), and someone—no one yet knows whom—powered down the plant.

“The terrorists wanted to blow it up at full pressure, so it would make a spectacular fireball that you could see from outer space. Had they gotten it to full pressure, that would have happened,” Wysocki says.

Wysocki, Zinner and Frazier would spend the next few weeks attending funerals and grieving lost friends. Among the dead were four BP employees, including 26-year-old John Sebastian, 44-year-old Carlos Estrada, 47-year-old Stephen Green and Rowan.

“For me that is the hardest thing,” says Wysocki, “coming to grips with Gordon dying.”

Since then, oil companies across North Africa and the Middle East have taken a closer look at security measures at their plants.


On January 27, CNBC reported that a London-based risk assessor and forecaster called Exclusive Analysis had warned its clients in July 2012 that gas installations in southwest Algeria were “a potential target.” Three months later, the forecaster warned that the terrorist group Al Qaeda in the Islamic Maghreb had “run short of funds” and that the shortage was likely to increase kidnappings in the region.

What, if anything, could have been done to prevent the attack? And what is being done now to ensure that gas plants in resource-rich but volatile countries are secure?

It is a complex and loaded question that few interviewed for this story felt comfortable discussing.

BP spokesman Robert Wine said the company does not comment on behalf of the joint venture in Algeria or on their security measures. However, he did write in an email that “security in Algeria is clearly down to the government, just as it is the U.S. government’s role in the U.S.” He added that BP “has been reviewing security at its operations across the region in light of the In Amenas tragedy.”

As the broader oil and gas industry does the same, Wysocki, Frazier and Zinner are taking some time off and watching with interest.

“There are oil fields all over Africa and the Middle East that need to learn from this,” Frazier says. “I think more could have been done.” 



Only the second woman in the country to earn a doctorate in petroleum engineering, Ramona Graves PhD '82 found her passion—but it wasn't what she thought it would be.

The Face of Petroleum Engineering

By Lisa Marshall

On her first morning of classes at Colorado School of Mines in 1977, Ramona Graves walked into Stratton Hall and stopped to ask the secretary for directions to the ladies' room. The answer she got said a lot about the industry that the young Nebraska transplant was stepping into.

"She said, 'Go out this door, then one block over and one block right,'" recalls Graves. "I looked at her and said, 'Pardon?' There were no women's facilities in the building. I had to go to the student center."

At the time, less than 2 percent of engineers in the United States were women, and Graves was one of only a handful of female students on the Mines campus. No woman in the U.S. had ever earned a PhD in petroleum engineering, and those trying to break into the field faced an uphill battle.

"It was this totally male-dominated culture," recalls Graves, a sharp, spirited redhead with a reputation for straight talk. "It was not a welcoming environment for women. It is now." (In May 2013, Mines awarded more degrees to women than in any previous graduation ceremony.)

Thirty-four years later, Graves had become—as Provost Terry Parker puts it—"the face of petroleum engineering at Mines." Through more than three decades of teaching, she has helped usher into the field hundreds of adoring students from around the world. Her research, largely focused on reservoir characterization and the use of lasers to drill for oil, has advanced the field. And as the Petroleum Engineering Department head from 2007 to 2012, she helped grow the program, building its diverse faculty and shaping the department's glistening new \$27 million home, Marquez Hall.

Today, after six months as inaugural dean of the newly formed College of Earth Resource Sciences and Engineering, the 62-year-old Graves says she is just getting started.

DEFYING STEREOTYPES

Born in the rural community of Dannebrog, Neb. (pop. 350), Graves says she grew up “tipping over outhouses and stealing watermelons.” Her father was a mail carrier and farmer. Her mother ran the local drug store. Like most young women growing up in the 1950s, Graves’ career options seemed limited.

“When I graduated from high school in 1969, I had three choices: Get married, be a nurse, be a teacher,” she says.

She graduated from Kearney State College in 1973 with degrees in math and physics and took a job as a high school math teacher. But within a semester she realized, “I hated everything about teaching.”

When a friend suggested she would make a good engineer, she started taking classes at the University of Nebraska to become a chemical engineer. “Women just didn’t go into mechanical, or mining, or petroleum,” she says. But once she started studying chemical engineering, she again knew right away that it wasn’t for her.

It wasn’t until she was doing research for a paper about the oil and gas industry that she found her niche.

“I liked the integration of geology and mechanical, and I loved the uncertainty and risk involved,” she says.

She applied to Texas A&M, Stanford University and Mines. Accepted at the first two, she was waitlisted by Mines, and it

wasn’t until the eleventh hour that she got the call saying she could attend.

“It was a Friday and school started on Monday,” she says. “I threw a few things in the car and headed out. My dad said, ‘Good luck. I hope you get a husband this time.’”

Over the next four years she would get married, have two children 13 months apart, and work as a consultant for a Denver petroleum engineering company, all while attending school full time. In 1982, she became the second woman in the United States to earn a doctorate in petroleum engineering.

The field was still booming, and, going forward, she had her pick of opportunities in the private sector. However, the first job offer she received was—of all things—to teach again.

She recalls how the PE department head at the time, Craig Van Kirk PhD ’72, told her he would pay half what she would earn in the private sector, and she would have to work twice as hard. “The one thing I hated to do was teach,” laughs Graves. But knowing almost any industry job would require her to travel regularly, she said yes, for her children’s sake.

This time, she loved it so much she never left.

“I always tell my students, I did not have some great life plan from the beginning,” she says. “I just kept my options open, and I am pretty good at self-assessment. If I did not like what I was doing, I did something else.”



COLLEGE OF EARTH RESOURCE SCIENCES AND ENGINEERING

Dean: **Ramona Graves**

Department of Geology and Geological Engineering
Department of Geophysics
Department of Mining Engineering
Petroleum Engineering Department
Division of Economics and Business
Division of Liberal Arts and International Studies



COLLEGE OF APPLIED SCIENCE AND ENGINEERING

Dean: **Anthony Dean**

Department of Chemical and Biological Engineering
Department of Chemistry and Geochemistry
Department of Metallurgical and Materials Engineering
Department of Physics
Materials Science Program
Nuclear Science and Engineering Program



COLLEGE OF ENGINEERING AND COMPUTATIONAL SCIENCES

Dean: **Kevin Moore**

Department of Applied Mathematics and Statistics
Department of Civil and Environmental Engineering
Department of Electrical Engineering and Computer Science
Department of Mechanical Engineering

WHAT ABOUT THIS

Following the creation of the College of Engineering and Computational Sciences in 2011, Mines announced the creation of the College of Applied Science and Engineering (CASE) and the College of Earth Resource Sciences and Engineering (CERSE) last fall. As part of our conversation with Graves, we asked for her perspective on this shift in administrative structure.

Q What are the biggest changes you have seen at Mines in your 33 years on campus?

A There have been three major changes that have really impacted how we do things: One was when we started to have very rigorous promotion and tenure procedures in 1985. The faculty panicked. People didn’t want to see rules changed. But today, because there is such a rigorous process, people take great pride in getting promoted here. Another was when we made research a bigger focus in the late ’80s and early ’90s. To be a world-class university, you have to have a rigorous promotion and tenure process and a cutting-edge



Thomas Cooper, Lightbox Images



Above Graves and Bernadette and Tim '80 Marquez celebrate a light moment at the September 2012 opening of Marquez Hall, the Petroleum Engineering Department's new home. Top right Ramona takes a ride on Blaster at the first Celebration of Mines event in 1994. Right In 1986, Graves was the only female faculty in the Petroleum Engineering Department.

COLLEGE STRUCTURE?

research program. Now, we have the change to a college structure.

Q Why do we need it?

A Before it was one school with 13 to 15 diverse academic departments all under one provost, who also had an array of other responsibilities such as the library and international programs. To do a good job at everything can be tough. Our provost felt the college structure would be better for the university as a whole—students and faculty. I agree.

Q How did Mines choose which departments to include in CERSE?

A We have always known that geology and geological engineering, geophysics, mining engineering, and petroleum engineering are a natural fit. We are all earth resource-based and are going to have many of the same industry partners. The four department heads have been meeting for 40 years on a weekly basis to talk about common needs and interests. Six years ago we asked the department head of economics

and business to join the group. We teach our students to add value to the companies they go to work for, and to make decisions in an uncertain economic world. It made sense for them to join us. Economics and business also has strong earth resource roots because of the mineral economics degree.

Q You also encompass the Division of Liberal Arts and International Studies.

A We work in countries in Africa and the Middle East, where there are different religions, and public policy is an important factor in how, and if, we can apply our technology. Together, we now have really strong earth resource departments, economics and business, and with the addition of liberal arts and international studies, we have the third leg of the stool. There is no stronger structure. It makes us unique in the nation.

Q How will it benefit the departments?

A Now we have three deans who are

well informed about the workings of the university. It is a lot easier for the provost to get opinions from three people than from 13 to 15. It gives all the departments a stronger voice with the provost and the president. We don't talk about what is best for our college, but what is best for the school, and how we can work together to make it happen. It is hard to reach that kind of consensus with 13 to 15 people around the table.

Q How will it benefit students?

A By having a stronger university, students will get a better education.

Q How long will it take for these benefits to be evident?

A Right now, it is still a time of change. But in three years, I think we'll start seeing some very positive outcomes. It's a bit like turning an oil tanker. Universities can't change course quickly like a sailboat. But a little course correction with a little time can make a really positive change. It will make the whole school stronger.





Top Graves flew by helicopter to the site of the Exxon Valdez oil spill in Alaska for field session in 1991. Above With Graves watching, graduate student Jim Lane '80, MS '83 works on his geomechanics research in the basement of Alderson Hall. The equipment was the same Graves used for her PhD research. Right Marquez Hall opening.



Thomas Cooper, Lighthouse Images

THREE DECADES' WORTH OF STUDENTS

Seated in a cramped second-floor library that is doubling as her office while the new one is being finished, Graves digs through a large bag of gifts from students recently back from spring break, some from the Middle East and North Africa—dates, an incense burner, a hand-woven shawl, perfume.

Students pop in and out in a steady stream to offer a warm hello to a woman they seem to genuinely like.

“She was a bit scary, but she cared a lot about her students and wanted us to succeed,” recalls Vicky Nielsen '92, a petroleum engineering graduate. “If you come to her office with a whole bunch of questions, she will answer every one, sometimes in excruciating detail, until you understand.”

On the wall behind her desk is a plaque commemorating the creation of the Ramona M. Graves Endowed Scholarship Fund, established last year by former students from the classes of 1989–1994.

Nielsen and fellow alumni raised \$28,000 in three months for the endowment, surprising Graves at the Society of Petroleum Engineers conference in San Antonio, Texas.

“They all laughed because they had never seen me speechless,” says Graves, who considers it one of the greatest honors of her career.

She also is proud of the diversity and quality she has helped bring to the department and the school. Today, 26 percent of

students at Mines and 36 professors (13 assistant, 15 associate and eight full) are women. Eight of these faculty members are in the department of petroleum engineering.

The number of international students has also soared: The Petroleum Engineering Department now hosts roughly 70 percent of the international students on campus. And its overall numbers continue to climb.

“We see dramatic student growth in that department right now,” says Parker. “Some of that is the marketplace, but some of that is her.”

In September, Graves celebrated another career milestone with the opening of Marquez Hall. Paid for entirely with private funding and designed by the same firm that designed the iconic Apple Store on Fifth Avenue in New York City, it is the first stand-alone academic petroleum engineering building to be constructed in the United States in decades.

“It was my baby,” she says, overlooking a modern, glass-enclosed atrium, adorned with geologically themed artwork that she helped design. “I approved every square inch, including the color of the carpet.”

As she moves into her new role as dean of the College of Earth Resource Sciences and Engineering, she has big plans, and lots of new responsibilities. But there is one thing she does not plan to give up: teaching. **M**

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ALUMNI NETWORK

ALUMNI WEEKEND

Reconnecting Over Three Days in Golden

Former members of band and choir, Department of Physics alumni, and the classes of '53, '63, '68, '73 and '78 celebrated together on campus during Alumni Weekend 2013, April 25–27. Here's a glimpse of the weekend in pictures (many more can be viewed at minesmagazine.com/alumniweekend2013).



Chelsea Panos

Barbecue on Kafadar Commons



Chelsea Panos

Catching up with friends



Amie Chitwood

Touring Edgar Mine



Tyson Brown '08, MS '11

CBS news commentator Douglas Brinkley spoke on U.S. presidential influence over energy policy.

2013 AWARD WINNERS

The following individuals were honored for their contributions to Mines during the Celebration of Alumni dinner, a highlight of Alumni Weekend.

Distinguished Achievement Medalists

Larry J. Buchanan '73, PhD '79

Donald L. Kammerzell '71

Deborah A. Peacock '78

Mines Medalists

Michael R. '83 and Patricia K. '83 Starzer

CSMAA Melville F. Coolbaugh Award


Monica Steikunas-Griffitt '88

CSMAA Outstanding Alumnus Award

Thomas Aude '62

CSMAA Young Alumna Award

Alicia Jessop '06

 Read more about the awards, the 2013 honorees and past winners at minesalumni.com; click on Hall of Fame.

STUDENT RETENTION

Alumni Make Freshman Connections

On April 1, CSMAA co-hosted the university's Freshman Connections event, which enabled 146 students to network with 43 alumni over an informal dinner designed to give students a window into what it takes to succeed at Mines and beyond. Here's what two attendees had to say about the event:



Joshua Duffy

Every day we work in class toward finally graduating, but sometimes it is hard to look beyond that. Meeting alumni who made it and are now using what they learned was like seeing a light at the end of the tunnel. Immediately following the event, I felt reassured that I would make it through, too.

—Katrina Ward, now a sophomore



Going to Mines is a shared experience, a bond between alumni and students. I think that having the chance to learn more about the opportunities ahead will encourage freshmen to push through the tough classes and overcome their doubts. This event is a great first step that will encourage them to ask more questions and join the mentor programs.

—Andrew Flynn '86, MS '98

ALUMNI ASSOCIATION

Meet the Colorado School of Mines Alumni Association Board of Directors

Have you ever wondered what the CSMAA board does? In this final installment, we highlight the remaining directors and their service to the alumni community.



Paul Wareham '85

Golden, Colo.

President

Leading the executive committee, Paul works with CSMAA staff, board members and school administrators on strategic and budgetary issues. He earned a bachelor's degree in civil engineering and is a registered professional engineer in the State of Colorado. While at Mines, he was a four-year letterman on the varsity football team and

participated in varsity track and field. Paul is currently a senior project manager for Logical Systems in Golden and an independent certified flight instructor.



James R. Larsen '65

Aurora, Colo.

President-Elect

Also a member of the executive committee, Jim will take over the role of president in 2014. After earning a professional degree in metallurgical engineering from Mines, he went on to a career that spanned several industries, including shift supervisor with Kaiser Steel, plant superintendent for NL Industries, mine manager for

Johns Manville, 22 years of sales and marketing, consultant and director of business development for a company in the municipal water equipment industry, and financial advisor. Now retired, he volunteers for several educational and civic organizations.



Oliver Dewey '12

Fort Collins, Colo.

Director, Student Life Experience

A recent graduate, Oliver works to strengthen connections between alumni and students. At Mines, while earning a degree in chemical and biochemical engineering and a minor in public affairs through the McBride Honors program, he held a variety of jobs on campus, including working for CSMAA and *Mines* and serving as president

of the Mines Activities Council and treasurer of ASCSM. He was also a member of Undergraduate Student Government and Tau Beta Pi. Awarded CSMAA's Alumnus of the Future Award in 2012, Oliver is now a group manager for Anheuser-Busch.




Mohan Misra PhD '86

Littleton, Colo.

Trustee Representative

Mohan serves as liaison between the Colorado School of Mines Board of Trustees and the alumni association board. He received his bachelor's, master's, and doctoral degrees in metallurgical engineering from Banaras Hindu University in India, University of Washington and Colorado School of Mines, respectively. Mohan is the founder

and CEO of ITN Energy Systems, a research and product development organization involved in identifying, developing and commercializing emerging thin-film and nano technologies.

 Find full bios for board members online at minesalumni.com/board. Interested in getting involved with the alumni association? Learn about the opportunities at minesalumni.com/volunteer.



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President

James R. Larsen '65
President-elect

Jafar Tabaian '00
Secretary

Paul Roamer MS '97
Treasurer

Serena Bruzgo
Interim Executive Director

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Darek Bruzgo '95

Oliver Dewey '12

Tracy Gardner '96, MS '98

Susan Evers Matsushima '97

Brady McConaty '78

Mohan Misra PhD '86

Paula Nolan '05

Raymond Priestley '79

Matthew Showalter '99

Cooper Swenson MS '04

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William Warfield '75

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csmaa@mines.edu
minesalumni.com



CLASS NOTES

1950

John R. Weyler is a partner for Keystone International Petroleum and lives in Houston, TX.

1953

Kelsey L. Boltz is a consultant for Boltz Group International and lives in Paradise Valley, AZ.

1956

George E. Reeves is a counselor for Fogani and Faunte and lives in Denver, CO.

1958

M. Nafi Toksoz is a professor emeritus for Massachusetts Institute of Technology and lives in Salem, NH.

1959

Duane Graham 

Charles McKinnis 

Edward R. Shackelford is a real estate agent for Real Lining CO Properties and lives in Denver, CO.

1961

Robert E. Crumb is a research engineer for Robert E. Crumb Data Applications and lives in Eight Mile, AL.

Laurence G. Preble is of counsel for Holland & Hart and lives in Boulder, CO.

1963

Robert D. Coale is the president and CEO of Patriot Gold and lives in Solana Beach, CA.

C. De Luca 

Graham W. Howard Jr. is the president of Illuminex LED Lighting and lives in Castle Rock, CO.

Robert Steele 

1964

Terry L. Campbell is a manager member for Tecoma Gold & Silver and lives in Ozark, MO.

1967

Stanley Howard 

Robert W. Scheck is the CEO of Alpine Engineering and lives in Golden, CO.



FINAL SAUDI HURRAH In September 2012, after a decade in retirement, John Sulzbach '56 accepted a project management assignment in Saudi Arabia, where he and his wife, Ann, spent three years in the mid-1970s. Working for an Egyptian engineering company, the mining engineer supervised the engineering and construction of highly automated chicken farms in the desert that will be largely monitored and operated remotely from Holland. In this photo, Sulzbach is meeting with a colleague at the hatchery near Al-Kharj.



You can read Sulzbach's own essay about this trip, including a connection to Osama Bin Laden, at minesmagazine.com/sulzbach.

1968

Edward J. Gibbon Jr. is VP, reservoir engineering for Tall City Exploration and lives in Houston, TX.

Gerald Grandey 

Gregory Hoyl 

Thomas K. Matson is working for the Colorado Department of Transportation and lives in Golden, CO.

1969

George D. Barnhill is a consultant for California Lutheran University and lives in Ventura, CA.

Thomas E. Martin is working for Thomas E. Martin Consulting and lives in Marble Falls, TX.

Thomas M. Mauro is a math and science teacher for Argosy University and lives in Denver, CO.

1970

Allen R. Cockle is a senior consulting engineer for Eurasian Minerals and lives in Castle Rock, CO.

Robert C. Scharp is a director at Westmoreland Coal and lives in Monument, CO.

1971

Roberto Aguilera is a professor and ConocoPhillips-NSERC-AERI chair for the University of Calgary based in Calgary, Alberta, Canada.

Donald F. Geesaman is a distinguished Argonne fellow for Argonne National Laboratory and lives in Downers Grove, IL.

C. Brent Hirschman is a tech development strategist III for Sprint Nextel and lives in Overland Park, KS.

Roger C. Neuscheler is a professional engineer for Silver Anvil Engineering and lives in Lone Tree, CO.

Eugene F. Scherrer Jr. is VP, operations for Txon Partners and lives in Cypress, TX.

Scott L. Stockton is EVP for Vector Seismic Data Processing and lives in Castle Rock, CO.

Daniel R. Walton is the CEO of DRWalton Advisors and lives in Annapolis, MD.

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COLORADO SCHOOL OF MINES RECENTLY* RECEIVED 11 OUTSTANDING LEADERSHIP GIFTS AND COMMITMENTS:

BP committed \$100,000 for the BP Scholarship Fund and STEM program support.

With a \$3,500,000 pledge, **Cimarex Energy Co.** established the F.H. "Mick" Merelli/Cimarex Energy Distinguished Department Head Chair in Petroleum Engineering in memory of Mines alumnus and former company CEO **F.H. Merelli '59**.

ConocoPhillips contributed \$530,000 in support for Marquez Hall, student organizations, and academic departments and programs.

Scott A. Goodwin Jr. '96 and his wife, **Katie**, established the Goodwin Endowed Scholarship Fund with a \$100,000 gift.

With an initial commitment of \$100,000 and an estate provision, **Gordon L. Gray '50** established the Gordon Lee Gray Endowed Scholarship Fund at Mines.

Harold M. Korell '68 and his wife, **Patricia**, made a commitment to match all gifts made by the Class of 1968 to The Mines Fund, up to \$250,000.

John P. '52 and **Erika H. Lockridge** bolstered support for their Blaster Scholarship Fund with a \$200,000 gift.

A \$250,000 contribution from **Phillips 66** provided support for the SHIELD Scholars Program and several academic departments and programs at Mines.

Fred C. Schulte '68 committed \$50,000 to The Mines Fund and an additional \$50,000 to augment the Schulte Endowment for the McBride Honors Program.

Southwestern Energy Company pledged \$500,000 to the Clear Creek Athletics Complex.

Bequest distributions of \$250,000 from the estate of **Marian K. Van Kirk** will support scholarships at Mines.

Other generous gifts and commitments of \$25,000 and more:

Adolph Coors Foundation contributed \$75,000 to the Coors Foundation Opportunity Scholarship Fund and the Multicultural Engineering Program Leadership Award Fund.

An **anonymous** donor contributed \$25,000 to the Colorado Fuel Cell Center.

Joe Coors Jr. provided \$50,000 in support for the Mines golf team.

Devon Energy Corporation contributed \$43,000 in support of the Devon Energy Scholarship Fund and the Leadership Summit.

Patrick J. Early '55 gave \$25,000 to The Mines Fund.

Edna Bailey Sussman Fund provided \$62,335 in support for Mines.

Eni gave a \$50,000 gift to support the Center for Hydrate Research.

Ben L. Fryrear '62 contributed \$25,000 to the Clear Creek Athletics Complex in honor of **Professor Emeritus Marvin L. Kay '63**.

Joe W. Gray '68 contributed \$25,000 to The Mines Fund.

Patrick M. '68 and **Sharon L. James** contributed \$25,000 in support for Mines.

Howard E. '76, MS '77 and **Cherine Janzen** made a two-year commitment of \$50,000 in matching funds to The Mines Fund as part of the E-Days Challenge Match.

Thomas E. Jorden '80, MS '87 made a gift of \$25,000 to The Mines Fund.

Marathon Oil Corporation contributed \$51,000 to scholarships, faculty support and several departments.

Jack W. '72 and **Cherri M. Musser** provided \$25,000 in support for The Mines Fund.

Shell pledged \$50,000 to support the Center for Oil Shale Technology and Research.

With a \$55,000 contribution, **Kevin A. '78** and **Susan K. Small** established the Small Endowed Scholarship Fund.

Andrew P. '78 and **Sherry Swiger** gave a \$35,000 gift to The Mines Fund.

Viola Vestal Coulter Foundation provided \$60,000 for scholarships and fellowships, the student wellness center and the Coulter Chair in Mineral Economics.

Don L. '56, MS '61 and **Patricia Ann Warner** bolstered support for their namesake Warner Scholarship Fund with a \$60,000 contribution.

Barth E. '79, MS '82 and **Maureen Whitham** provided \$50,000 in support for The Mines Fund.

XRI Geophysics contributed \$30,000 to the XRI Geophysics Fellowship Fund.



COLORADO SCHOOL OF MINES
FOUNDATION

* The CSM Foundation received the gifts and commitments listed here between 1/1/13 and 5/15/13.

1972

D. Victor Bush is a global energy program manager for Tetra Tech and lives in Littleton, CO. 📍

John M. Feasler is the president and CEO of Assessment Strategies and lives in Park City, UT.

C. Romaine Gerould is an enablement supervisor for ConocoPhillips and lives in Wichita, KS.

Franklin E. Grange II is a VP for OptTek and lives in Colorado Springs, CO.

Thomas M. James is a physician/pathologist for AmeriPath North Texas and lives in Dallas, TX.

Ralph D. Rogers is an engineer for Nuclear & Regulatory Support Services and lives in Las Vegas, NV.

Victor A. Sterner Jr. is a blasting consultant for Austin Powder and lives in Lancaster, OH.

1973

Lynn M. Dayton is working for Shell Oil and lives in Lansing, MI.

Brian L. Evans is VP, business development for ITS Property & Casualty Consulting and lives in Frisco, TX.

Timothy Hawkes 📍

Michel P. Juillard is a board member for Sunward Resources.

John L. Kirk Jr. is SVP—sales excellence for SICK and lives in Eden Prairie, MN.

Hamza T. Mabruk is a logistics manager for High National Election Commission based in Tripoli, Libya. 📍

Victor J. Miller is a consulting engineer II for Newmont Mining and lives in Winnemucca, NV.

1974

Murray M. Aitken is a senior safety representative for Frontier-Kemper Constructors and lives in Mercer Island, WA.

James S. Crompton is a director for Information Pipeline and lives in Colorado Springs, CO.

Ronald D. Drake is a VP for underground construction for EPC Consultants and lives in Arroyo Grande, CA.

Steven D. Gilbert is a reservoir engineering manager for WPX Energy and lives in Parker, CO.

Lawrence A. Johnson is the founder of ILX Lightwave and lives in Bozeman, MT.

Richard LaPrairie 📍

Gary L. Nydegger is the president of Arctic Falcon Exploration and lives in Golden, CO.

Thomas Plate 📍

Gary A. Wilkinson is a senior supervisor drilling and fragmentation for Climax Molybdenum and lives in Frisco, CO. 📍

1975

Theodore S. Allen III is a petroleum engineer for Proex Energy Consultants and lives in Spring, TX. 📍

Judith C. Brazie is the president of JCB Engineering and lives in Sandia Park, NM.

Mike E. Brazie is a senior staff engineer for Pueblo of Laguna and lives in Sandia Park, NM.

Ralph A. Briley is a licensing project manager for ExxonMobil Research & Engineering and lives in Springfield, VA.

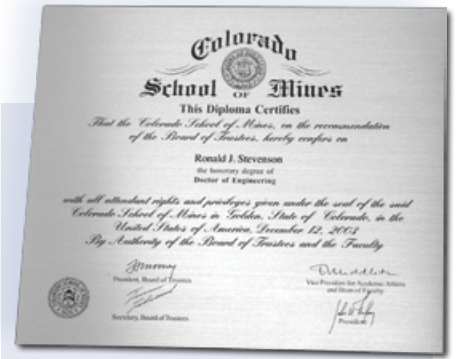
Michael G. Leidich is the president and CEO of Aldershot Resources and lives in Golden, CO.

Raj Sharma is an adjunct professor for Columbia University and lives in Princeton, NJ.

1976

W. Jerry Evans 📍

Kathy J. Hays-Stang is a teacher for University of Texas at Arlington and lives in Colleyville, TX.



SILVER DIPLOMAS

If you received an undergraduate degree from Mines some time from the 1970s to 1990s, you may not have had the opportunity to obtain a silver diploma. The high cost of silver almost ended the tradition in the 1980s until Ralph L. Hennebach '41, then chairman and CEO of the United States' largest silver mining and refining company, Asarco, offered to provide the silver if Mines would continue making the diplomas. Today, alumni can purchase a silver-plated diploma for \$150 at inside.mines.edu/Diplomas.

1977

David W. Ashcom is a senior project manager for CDM Smith and lives in Newcastle, WA.

Gary E. Houghton is an engineering advisor for Encana Oil & Gas (USA) and lives in Littleton, CO.

Dean G. Liley is a strategic planner for Encana Oil & Gas (USA) and lives in Denver, CO.

Allen E. May is a VP—business development for HightMount E&P and lives in Spring, TX.

Robert A. Mitchell is a project manager—facilities—Canada for Marathon Oil based in Calgary, Alberta, Canada.

Richard R. Whitlow is a petroleum engineer for Orbis Engineering and lives in Castle Rock, CO.

1978

Miles W. Barrett is a deep water IM/IT manager for Shell Exploration & Production and lives in New Orleans, LA.

Mark W. Berkstresser is a business/solution architect for Chevron and lives in Bellaire, TX. 📍

David E. Bunnell is an assistant professor, general engineering for Montana Tech and lives in Butte, MT.

Kathryn R. Cain is executive officer at the U.S. Army's Pueblo Chemical Depot.

Michael J. Dern is a VP corporate engineering for Forest Oil and lives in Evergreen, CO.

Thomas E. Flaherty is a chief architect for Axiom Architectures and lives in Centennial, CO.



YOU NEVER KNOW WHERE YOU'LL FIND A MINER

Based in different areas of the U.S., three alumni working for KBC Advanced Technologies discovered their Mines connection when they converged in Ecuador to work on the same project. From left to right, Zach Miller '02, Mike Mikulicz '68 and Matt Lehr '07 are implementing best practices for the PetroEcuador-Esmeraldas refinery.

Frank H. Hutto is working for Central Illinois Dragstrip and lives in Cherry Hills Village, CO.

Milo Nance is working for Lockheed Martin and lives in Highlands Ranch, CO.

Deborah A. Peacock is the president/CEO and managing partner of Peacock Myers P.C. and lives in Corrales, NM.

Brian W. Sherwood is a senior systems specialist for Enterprise Products Partners and lives in Sugar Land, TX.

Kevin A. Small is an exploration manager for Tri-C Resources and lives in Houston, TX.

James K. Swain is a manager NOJV for Chevron and lives in San Ramon, CA.

John B. Warren is a VP of operations for CCI and lives in Parker, CO.

Rick D. Watts is a senior engineering fellow for ConocoPhillips and lives in Houston, TX.

1979

Joseph D. Achierno is an operations manager—Sadara for Dow Chemical and lives in Midland, MI.

David L. Bartel is VP, investor relations and external affairs for SouthGobi Resources and lives in Hong Kong.

David A. Bird is a geophysicist for Bird Geophysical Consulting and lives in Greenwood Village, CO.

H. Thomas Bowles is a wells team leader—offshore operations for BP America and lives in Franktown, CO.

Peter A. Drobeck is a director of new exploration for Silver Standard Resources and lives in Golden, CO.

Richard E. Fraley is a managing director—CEMOF for The Carlyle Group and lives in Farmington, NM.

W. Tyler Geiger III is director, energy and Verbund management for BASF and lives in Missouri City, TX.

Mark A. Hamouz is a VP for Alfred Benesch & Company and lives in Centennial, CO.

Wendy A. Klein is a geologist for SGP Resource Consultants and lives in Greenville, NC.

Jerome Law 

Joseph P. McConnell is a senior program manager for McKesson and lives in Denver, CO.

Alan J. Mencin is a principal for Mesa International and lives in Golden, CO.

Elizabeth E.R. Niemtschik is a senior reservoir engineer for Cimarex Energy and lives in Littleton, CO.

Barry W. Norman is a manager—midstream engineering for EDG Consulting Engineers and lives in Houston, TX.

Andrew S. Peterson is VP, operations for Integrated Petroleum Technologies and lives in Loveland, CO.

Ronald K. Powell Jr. is SVP for Woodmoor Group and lives in Indian Hills, CO.

William B. Schafer III is the president and CEO of Resonant Management Solutions and lives in Boulder, CO.

1980

Debra J. Batory is a manager, geological technology for Plains Exploration & Production and lives in Sugar Land, TX.

Donald J. Carpenter is working for Arcadis and lives in Brighton, MI.

Douglas D. Colby is a senior operations engineer for Whiting Petroleum and lives in Evergreen, CO.

Julie F. Gibbs is a business coach for Idaho Small Business Development Center and lives in Hayden, ID.

Philip O. Johnson is a senior drilling engineer for Fidelity Exploration and Production and lives in Arvada, CO.

Loren R. Lasky is a case manager in the Bureau of Case Management for New Jersey's Department of Environmental Protection and lives in Titusville, NJ.

Timothy M. Marquez is the executive chairman for Venoco and lives in Denver, CO.

Chris A. Oglesby is a development geoscience manager for Mubadala Petroleum based in Bangkok, Thailand.

Michael H. Partin Jr. is a drilling manager for Talos Energy and lives in Houston, TX.

Robert R. Vogel is VP, process improvement for Vulcan Materials and lives in Saint Charles, IL.



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ALUMNI ASSOCIATION
COLORADO SCHOOL OF MINES

Editor's Note: Alumni from the classes of 1981 to 2012 who have recent updates online or have uploaded photos to minesalumni.com over the last four months are listed below. In addition, all class notes published in *Mines* magazine in the last four years are available on the site. When you visit, if you take a few moments to enter your latest information and upload some photos, we'll list your name here in the next issue. For online viewing instructions, click on Class Notes at minesmagazine.com.




1981

Kenneth E. Beeney 
 Susan Bowman 
 Melanie D. Gipe
 Todd T. Grimmett
 Alfred E. Keller
 Lynn K. Kendall
 Douglas C. Peters
 Martin W. Sharps 
 Mark H. Thomas
 Marc A. Tidquist
 Randall L. Walberg

1982


Rene Abreu 
 Matthew R. Earlam
 Todd J. Fockler
 Michael J. Foley 
 Douglas V. Gallagher
 Pablo Hadzeriga
 Brett Harrington 
 Steve L. Harrison
 Sandra J. Hollenbeck
 Thomas J. Majewski
 Brian M. McGinnis
 Michael T. Schwein

1983

James E. Banaszak
 Joan M. Burgert
 Margie Collins
 Darrell D. Dinges
 Jeffrey E. Fulmer
 Kimberly Manesiotis Greer
 Crystal Long 
 Christine L. Miller
 Mark A. Oberle
 Scott Oldham 
 J. Kevin Samuel
 Gary J. Sanchez
 Paul A. Sease
 Paul Slocum 
 Cynthia A. Truby
 Timothy E. Tyrrell
 John G. Weihe
 Glenn D. Weller
 Paul R. Weller


1984

Mark E. Baker
 Jean-Pierre D. Blangy
 Thomas S. Caldwell




Jay W. Clements
 William H. Dears
 Mark F. Dennis
 Daniel E. Elvera
 Craig Fulton 
 Randall S. Furst
 Douglas P. Hazlett
 Richelieu V. Hoff
 Brian D. Huff
 Larry D. Kennedy Jr.
 Fred A. Kruse Jr.
 Gerald S. Lane
 Eric J. Newman
 Paul R. Onsager
 William C. Sanstrom


1985

Richard G. Allen
 John W. Anthony
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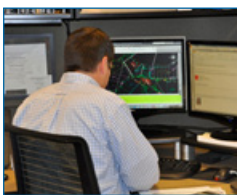
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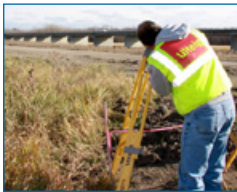
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ALUMNUS PROFILE

World War II Veteran Hugh Evans Still Comfortable in the High Country

10th Mountain vet recalls nights before the huts

Ed.: Having had plans to feature a profile of Hugh Evans for several years, the following article, recently published by The Denver Post, caught our attention. It's not easy to do justice in a short article to this remarkable pioneer and leader, but Bruce Finley did an excellent job. We hope you enjoy it as much as we did.

War veteran, miner and great-grandfather Hugh Evans [49] is drawn to the Colorado mountains where, 70 years ago with other young men full of hope, he trained for battle on skis.

Evans, 89, is among the last surviving World War II veterans of the Army's 10th Mountain Division who are able to load on a backpack in a snowstorm and ski fearlessly into the icy terrain above timberline. When he ascends, memories wash over him—of camping here long ago, combat, mining—and the people he knew along the way.

Evans grew up in San Rafael, Calif. His parents sent him by train cross-country to the elite Philips Exeter Academy in New Hampshire. The United States was preparing to enter World War II. After Evans graduated, he was drafted and moved into a new division formed to counter German forces adept at patrolling mountains and fighting on snow-packed and rugged terrain. Evans arrived at Colorado's Camp Hale amid war games designed to push soldiers to their limit.

He was assigned to a post in Italy, where he became a platoon sergeant when the prior sergeant was killed. Evans held that position until he was wounded on April 14, 1945. He was awarded a Silver Star for his service during the battle in Italy for Mount Gorgolesco.

UNCLE BUD'S HUT

After the war, he studied at the Colorado School of Mines, which prepared him for a career as a mining engineer around the world. He retired as a coal company president. He and his wife, Ann, raised four children and have 11 grandchildren and three great-grandchildren. They live in Boulder's Frasier Meadows community.



A log cabin with bunks for 18 mountaineers and no running water, this is one of 34 backcountry huts managed by the 10th Mountain Division Hut Association. It is named for Bud Winter, who was killed in the war. Photos inside show Winter on skis, developing techniques of descending slopes that led to creation of the ski industry.

The cabins perch around timberline beneath peaks, in this case 14,421-foot Mount Massive. Reaching Uncle Bud's in the winter requires a 6-mile ascent that begins

west of Leadville at Turquoise Lake and cuts up, past abandoned mines and through pine trees that grow smaller and more gnarled as air grows thinner around timberline.

The elevation is 11,380 feet, and the porch looks out on Mount Massive and cornices on 12,800-foot Galena Peak.

Evans ventured up recently with four descendants of other 10th Mountain Division veterans and friends who share his love of the mountains. The latest ascent marks Evans' 44th trip to a hut—shortly before his 89th birthday on March 21. He plans to celebrate his 90th birthday next year by skiing to a similar hut two valleys to the north.

Question: What do you remember about training in these mountains in the 1940s?

Answer: We didn't have huts. We slept out every night. We'd learned that a tent was no good because it didn't breathe and ice crystals built up on the tent. When you bumped it, ice went down your neck. That was very uncomfortable and it was a nuisance to put it up and a nuisance to take it down. At night, what I'd do was flip the pack off, stomp a hole in the snow and flip my skis over. We had double bags. Put them on top of the skis. Take my boots off. Put the boots between the inner bag and the outer bag and crawl into the inner bag. We stood guard at night, even in training.

Q: What do you remember about the war?

A: Sgt. Fischer, he was the platoon sergeant. When we attacked Gorgolesco, he was riddled in the chest with machine gun fire.

I was trying to put a patch over the holes so he could breathe, prevent the air from evacuating. I cut the back out of Mac Mackenzie's parka and was doing that when he died in my arms, saying: 'Please not now. Please not now.'

Q: Fischer's death must have enraged you.

A: Yes. We had trained together. He was my platoon sergeant. I was second in command. You know him almost like your brother.

Q: How did anger affect what you did?

A: I didn't feel that way toward the enemy. They are the other guys. You are trying to protect yourself and take their position. They are trying to hold their position and protect themselves. I didn't have real anger at the Germans. I was angry because Sgt. Fischer was dead.

Q: Does it get easier as time passes to make sense of war experiences?

A: Yes and no. Why war? Man started out defending his wife and family and territory. It was a kill-or-be-killed kind of environment. Unfortunately we haven't found the answer yet to dealing with the differences between men's opinions and feelings. It is extremist governments that take over—like Hitler. Germany was a socialist country. Socialism is very, very dangerous. You get the wrong leader in that environment and you're in serious trouble.

Q: Do war memories disappear?

A: They don't haunt me. But, no, they don't go away. They're like members of your family—your father, mother, friends—the things you have done. They are part of your life. You grow up with them. Your attitude is awfully important. I've always had an optimistic attitude. Make the best of what you've got and move on.

Q: Why did you set out last year to memorize the Rudyard Kipling poem, "If"?

A: I've always remembered "If." I love the writing of Kipling and the other great poets and writers. They're people that have put an awful lot of thought and beauty into that thought. "If" is a poem that has a lot of meaning. I just pasted it up on the mirror in the bathroom where I brush my teeth each morning and worked at it until I got it down pretty well. I'd just say it to myself.

Q: What historical figure do you admire?

A: The first person that comes to mind is [Dwight D.] Eisenhower as being a fine general and a fine president. I like reading history. I like going back and reading about the formation of the United States.

Q: When people call your generation "the greatest," how does that strike you?

A: We were challenged and we performed well. The results were unbelievably good for the country and the world. The right thing after World War II was not to do what was done after World War I. That was to let the enemy try and recover on his own, rather than step in and try to create a stable and peaceful society. I see the soldiers in Vietnam and Afghanistan

and those that went into Korea and Vietnam as being at least as great as our generation—but in a different way.

I feel we have a tremendous responsibility to be keepers of the peace. The actions in Iraq and Afghanistan are peacekeeping activities. You've got terrorists that, if they do take over the country, they're going to be tyrannical—like Hitler. It's a terribly difficult thing. You don't like the killing. But, if you walk away from it, I don't think you help the situation. Each generation has its own challenges.

A MINES FASCINATION



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During a recent conversation in his Boulder, Colo., home, Hugh Evans '49 said, "Work is a balance between fascination and frustration." He's certainly experienced plenty of both over the last 89 years.

His fascination with mining, which began at age 14, led him to Golden in January 1946 after being discharged. Although he'd been accepted at MIT and CalTech before the war, he felt Mines was a better fit.

A fascination with singing led him to restart the Mines Glee Club, luring students with the promise of free beer on Friday nights for singing at a local bar.

During a blind date at a fraternity costume party in January 1949, he met Ann Gullberg, beginning the longest fascination of his life. They were engaged later that year in California, and recently celebrated their 62nd wedding anniversary.

After his father died later that same year, Hugh traveled east to be closer to Ann, a junior at the University of Colorado Boulder. His plan was to work at the Climax Mine in Colorado, but on the way he stopped near Salt Lake City at the Bingham Canyon copper mine, in part because the owner of the mine, Kennecott, had helped support Hugh with a scholarship at Mines. They hired him on the spot.

Evans benefited from another Mines connection years later when, in December 1956, Utah Construction & Mining hired him as a project manager for its Zamboanga Development Company in Zamboanga, Philippines, upon the recommendation of Colonel Wendell Fertig, Evans' ROTC officer at Mines.

"Mining has given me a full and fascinating life, which I believe has served mankind in a constructive way," said Evans during a talk he gave in Boulder in 2012.

He's maintained strong connections to the university throughout the years. In addition to having two alumni grandsons (Christoph Hurley '10, MS '13 and Daniel LeVon '12), Evans served on the board of trustees from 1997 to 2005, is chair of Mines' Research Institute and gives generously—Hugh and Ann are Gold Level members of Mines Century Society, and Hugh is a life member of the alumni association.

“From a moral standpoint, I disobeyed an order because I couldn’t believe that the order was right.”

Q: What quality do you most admire in a woman?

A: Faithfulness. Patience. I’ve had a very patient wife. We’ve been married 62 years. We moved 29 times. We’ve had four children and we have 11 grandchildren. Four of them have been married for enough time to produce three great-grandchildren. The treasure of life is a family. And that is a commitment.

Q: What quality do you most admire in a man?

A: Willingness to do what needs to be done in the correct way.

Q: What has been your greatest joy?

A: My wife and our children.

Q: What’s been your greatest sorrow?

A: Our minister asked: What was the biggest challenge you had? It was sort of like the question you just asked. Challenges come in different forms. Physical, like getting your body up here [in the mountains] with a big pack on.

It can be mental, emotional, moral.

I was ordered by my lieutenant to shoot a German that was buried in a bunker and calling out for help. He ordered three of us to shoot him. I couldn’t do it. I shot well over his head. But he was killed. From a moral standpoint, I disobeyed an order because I couldn’t believe that the order was right. That’s a moral challenge.

Emotionally, when the shelling began on the climb to

Gorgolesco, my body went like ice; just froze. My challenge was to get through that. When I realized the column had moved on and the man in front of me hadn’t moved, I knew

I had to do something. ‘Get up.’ I asked him: ‘Where’s the man in front of you?’ ‘I don’t know. He’s gone.’ ‘Follow me.’ They come, these things. The greatest challenge, probably, is to try to manage each situation in the best possible way you can.

Q: Is there a need for people coming home from war to forgive themselves?

A: Of course. But I’ve always looked forward. Not backward. When I got out of the Army, my purpose was to get an education. I went to the Colorado School of Mines on the GI Bill. I got out of school. And then, at that time, I felt, this is when you get married and have a family. And get a job. Ann and I met. We married. We’ve had a wonderful family. I haven’t had any real regrets. That doesn’t mean I’ve done everything right by any means at all. But what is done is done and you’ve got to move on.

Q: How would you like to be remembered?

A: As I am.

—Bruce Finley

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Matthew Ellsworth Patent Attorney, Principal
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M.S., Engineering Technology Management, 2005
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Brad Knepper Patent Attorney, Principal
B.S., Electrical Engineering, 1998

Bruce Kugler Patent Attorney, Principal and
Firm President - B.S., Petroleum Engineering, 1981

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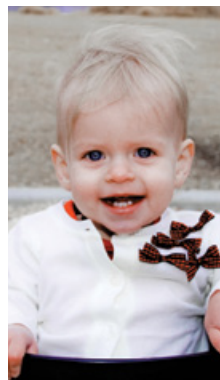


KNOWLEDGE SHARING Amber Moran '09, a volunteer for Summit County Rescue Group, traveled to a remote part of China in September 2012 with her organization and the Rocky Mountain Rescue Group as part of a cultural and training exchange with the Sichuan Mountaineering Association. The American teams taught avalanche rescue, high angle rope rescue, and search tactics, and the Chinese rescue team organized and led tours of cultural and historical sites. Moran explains that the Sichuan Mountain Rescue Team has very limited resources to cover a huge area. "Our exchange helped to develop those resources and provide a training foundation." She credits her Mines education—particularly the Humanitarian Engineering Program and her Senior Design project—for cultivating an interest in volunteering for global programs like this. Moran is an environmental engineer with Freeport-McMoRan Copper & Gold.

 Amber shares more photos of the trip at minesmagazine.com under Web Extras.



GIVING BACK, GETTING HITCHED Sean Fitzsimons '11 and Cindy Allshouse '11 were married on March 10, 2012, on top of Lookout Mountain in Colorado. They met at Mines in the Alpha Phi Omega service fraternity. Four Mines alumni were in the wedding party: Michelle Reynolds '12 (far left), Jennifer Bollig '12 (second from left), Ryan Hild '11 (best man) and Andrew Suderman '13 (far right). Dozens of Mines alumni and current students also attended.



HAPPY AND BREEZY Jared and Katie Thompson Rockman '00 welcomed their first child, Josephine, on November 2, 2011.



FORESIGHT

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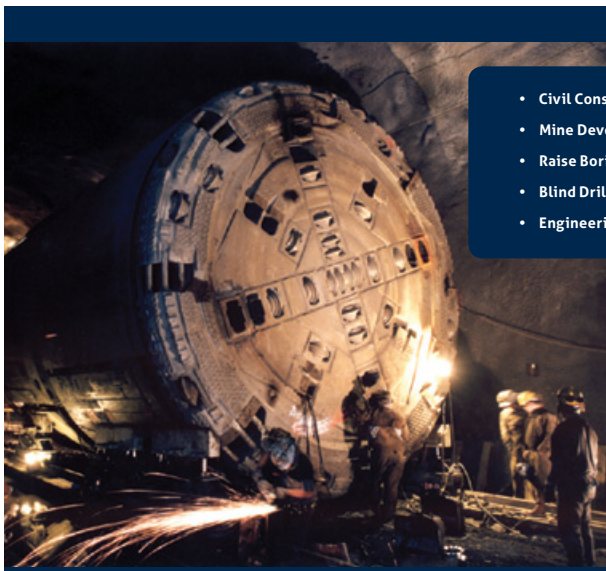
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GENERATIONAL WEDDING

Amy and Janson Ferrera '09 were married on November 17, 2012, at St. Louis Catholic Church in Louisville, Colo. Several Mines alumni attended, including Janson's parents, Carol '74, MS '94 and Kenny '72, MS '74 Ferrera; his sister, Alissa Ferrera '05; his uncle, Dennis Ferrera '72; his cousin, Robert Ferrera '96; and several Beta Theta Pi fraternity members.



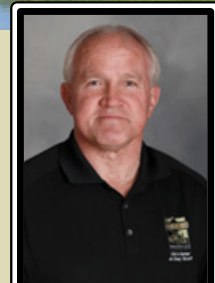
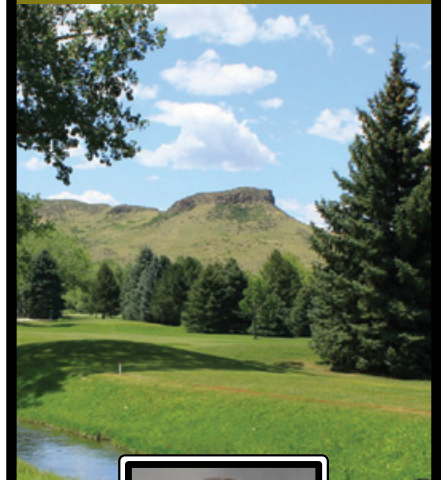
IT'S A BOY! CSMAA board member Cooper MS '04 and Brenda Swenson welcomed their first child, Bennett, into their family on January 30, 2013.



PERUVIAN ADVENTURES After three and half days of backpacking along 26 miles of the Inca Trail in Peru, Jacob Richey '09 (left) and Nick Zehring '10 reached Machu Picchu. "Each turn seems to hold the best view you've ever seen," says Zehring. "At one point along the hike, we stopped at a local village and drank *chicha* out of a garbage can in a dirt floor hut with some locals. The corn beer was nothing like a beer at Coors Lab, but was one of our more memorable moments with the locals."



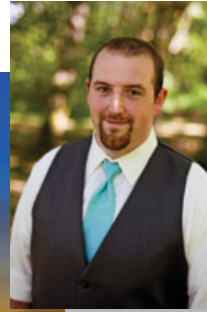
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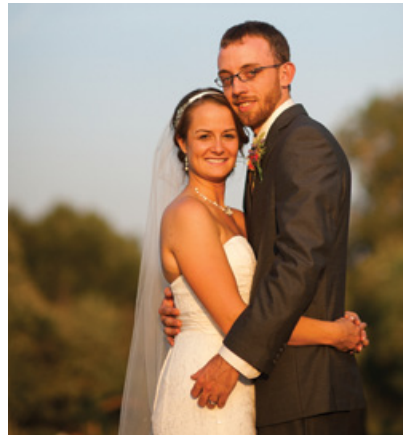
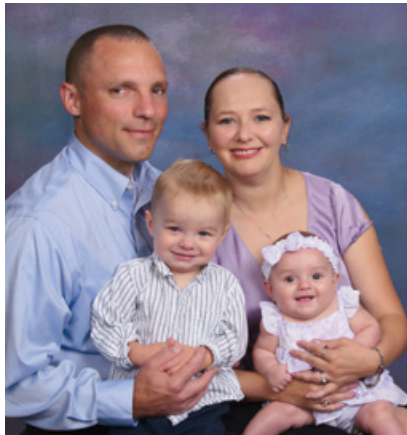


TOUGH TRUCK Jamee Thurlow '11 has been hard at work for Daimler Trucks on an M917A3 military dump truck, designed to be an upgraded version of the U.S. Army's current heavy-construction dump trucks. With two others on his team, Thurlow designed components

for the exhaust system, rear suspension, frame equipment, front cab mounts, and rear tow/tie-down cross member and provisions. "We got our hands dirty, too, modifying, assembling and installing components," he says. The truck has a GVWR of 100,000 pounds, integrated armor on the firewall and floor with provisions for a fully armored cab, a 12.7L Detroit Diesel engine with 500 hp and 1650 lb/ft of torque, and a blackout lighting system.

JOYFUL FOUR

With much pride and happiness, on March 30, 2012, Michelle and Jason Carmichael '98 welcomed their second child, Gwynndolyn, who joins brother Chase, born February 16, 2011.



AUTUMN WEDDING

David Melton '11 married Bethany Greene on September 20, 2012, at the Denver Botanic Gardens at Chatfield. Groomsman Eric DePinto '13, Michael Pierce '10 and Kris Turner '09, MS '11 attended the wedding. The couple lives in Longmont, Colo.: David works as an engineer at Seagate Technology; Bethany is a nurse at Boulder Community Hospital.



AN AUSPICIOUS START

Almas MS '08 and Ultay '10, MS '10 Istayeva married on September 10, 2010, in Kazakhstan. Aizada Abdrakhmanova '10 and Amir Kairbekov '10 joined the celebration. The couple met in the American embassy in Almaty, Kazakhstan, where they were both applying for student visas in August 2006 to attend Mines. They live in Kazakhstan with their son, Amirkhan, born June

11, 2011. "We both still plan to come back to Mines for a PhD—maybe in a couple of years," Ultay says.



Cameron S. Ernick
 Stacie L. Erbes
 Ashley M. Fish
 Margaret H. Game
 Frederick C. Garcia
 Matthew W. Gilmer
 Monica L. Grigg
 Erica T. Hanley
 Werner M. Heigl
 Tyler D. Holtzinger
 Thomas J. Hunt
 Charum K. Kolong
 Kyle R. Koontz
 Christopher D. Kramer
 Daniel P. Loewen
 Ann M. Lott
 Nijat Mehtiyev
 David P. Melton
 Odon M. Musimbi
 William Nagle
 Ricky L. Nguyen
 Courtney A. Nowill
 Marty D. Otzenberger
 Marc Petrequin
 Kevin J. Raber
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 Lance A. Sweenhart
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 Christopher J. Cabusao
 Samantha K. Cardenas
 Jacob R. Case
 Kevin B. Chaffer
 Enrique A. Chait
 Molina
 Connor R. Chapman
 Swee Yit Chung
 Allysia M. Cisneros
 Mark A. Claassen
 Jeffrey S. Clawson
 Onur Conger
 Alexander J. Corey
 April R. Corpuz
 Jeffrey H. Covington
 Katy R. Crawford

Heather J. Davey
 Liz I. Del Cid
 Oliver Dewey
 Christopher R. Douglas
 Obi Ehi
 Ryan J. Eustance
 Mallory C. Faust
 Paul C. Franklin
 Kyle E. Froetschel
 Nubia L. Galindo
 Laura A. Garchar
 Chad S. Garrett
 William R. Garrett
 Willem P. Geyer
 Megan A. Gift
 Mark Gillings
 Amanda M. Girten
 Shane W. Giskaas
 Maria Rosa Gobitz
 Gerardo O. Gonzalez
 Miriam I. Gonzalez
 Austin M. Granger
 Sean M. Gueck
 Josue Gutierrez
 Laith H. Haddad
 Chad E. Haidle
 Timothy J. Halper
 Jesse C. Hampton
 Sophie J. Hancock
 Alexander S. Hardie
 Stephen G. Harmon
 Sean P. Helster
 Patrick C. Higgins
 Brian K. Holland
 Timothy W. Hunt
 Caitlin J. Hurley

Chinyere K. Isaac-Heslop
 Brent A. Johnson
 Yaser N. Kattoum
 Zachary C. Keller
 Kaily E. Kilcrease
 Hyotae Kim
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 Brian J. Leach
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 Melanie D. Peterson
 Jonathan C. Pigg
 Benjamin W. Pohlman
 Matthew J. Poulin
 Bradley T. Price
 Kristopher A. Pruitt
 Darren R. Rabosky
 Kelly M. Ramirez
 Brittney A. Ransome
 Mikayl J. Reiter
 Cody A. Renken
 Michelle L. Reynolds
 Nicholas J. Riggert
 Joel M. Riggins
 Joseph J. Robertson
 Pierce A. Rohde
 Kiley C. Rucker
 Tyler S. Samuelson
 Casey R. Sande
 Derek W. Sanders

Caitlin N. Sellers
 Joshua T. Shannon
 Felipe Silva Ardila
 Heather D. Smith
 Michael A. Snapp
 Maxfield M. Stackhouse
 Leanne Stember
 Leanne M. Stember
 Kristin G. Straily
 David B. Streusand
 Shaun L. Strombeck
 Briana N. Suppes
 Ian R. Sutton
 Courtney N. Tamulis
 Matthew L. Taulton
 James P. Taylor
 Matthew T. Taylor
 Allen E. Thomas III
 David J. Thul
 Damir Trncic
 Alex J. Turner
 Martin D. Uceda
 Ashley K. Valdez
 Andrea C. Vega
 Antonio J. Velasquez
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NIPPY NUPTIALS Bobby Strain '11, MS '11 and Kristin Barrett '11 were married at Breckenridge Ski Resort on December 28, 2012. Heath Butler '10, MS '11 and Catheline Colon '10 were in the ceremony, with five other alumni and several family members attending the brisk, 6-degree Fahrenheit outdoor ceremony. Kristin and Bobby met in the machine shop during the second week of their mechanical field session. “We had to design a nutcracker and I wasn’t fond of his design—I didn’t think it was Mines-y enough since it didn’t show our M,” says Kristin. Soon after their week together, the couple began dating and were engaged shortly after graduation.



WORLDWIDE ENGINEERING COMMUNITY Miners in 26 U.S. cities and 16 countries celebrated E-Days 'Round the World April 4–6, joining in a longstanding alumni association global tradition. In addition to events in cities around the U.S. and this gathering in Lima, Peru, E-Days parties took place in Brisbane, Australia; Bucharest, Romania; Calgary, Alberta; Vancouver, British Columbia; Den Haag, Netherlands; Islamabad, Pakistan; Jakarta, Indonesia; Kuwait; Moscow, Russia; Paris, France; Perth, Australia; Port Moresby, Papua New Guinea; Port of Spain, Trinidad; Stavanger, Norway; and Ulaanbaatar, Mongolia.



WAY TOO CUTE Greg MS '05 and Andrea (Fleming) '05, MS '08 Taillacq announce the arrival of their daughter, Taylor, born September 10, 2012.



BLOSSOMING BUDDIES Katelyn was born February 3, 2012, to Krystal and Brian Boudreau '06, joining brother Kody, who was born March 3, 2009.




THRICE AS NICE Robin '01 and Staci Usagani's triplets—Katherine, Margaret and Isabella—turned 3 on February 15. (Staci attended Mines 1996–1998.) “Finding out we were pregnant with spontaneous triplets was such a surprise,” Robin says. “Our lives are very busy, but they bring us so much joy.”

OUR BIGGEST FAN We didn’t stage this—honest. Gabriel (3), the son of Bracken '06 and Kristina Spencer, was intently studying the spring 2013 issue of Mines when his mom took this photo. Kristina has noticed engineering tendencies. “He has been telling us since he was two that he will go to the moon,” she says. The couple, married in 2005, live in Montana with Gabriel and their three other children: Karyna (6), Isaac (2) and Katrielle, born February 2, 2013.



ALUMNI: What in the world are you doing? Send us your photos and a brief description of your activities (for instance, getting married, growing your families, traveling, meeting other alumni) to magazine@mines.edu.



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“When you are sorrowful look again in your heart, and you shall see that in truth you are weeping for that which has been your delight.”

—Kahlil Gibran



DARRELL J. BECKLEY '53 of Brush, Colo., died August 29, 2012. Born in 1926, Darrell served in the U.S. Navy from 1944 to 1947. Upon his discharge, he enrolled

at Colorado School of Mines, where he joined Kappa Sigma fraternity and played varsity football—his 1951 team was inducted into Mines' Athletics Hall of Fame in 1999.

Darrell, who earned a professional degree in petroleum engineering from Mines, served as an officer in the U.S. Army from 1950 to 1958. He married Janice White in 1951, and in 1958 the family moved from Denver to Brush, where Darrell continued his work in oil and gas exploration. He and Jan were involved in the Catholic Church, serving as leaders in the marriage enrichment classes for the Archdioceses of Denver for several years. After retiring, they served for seven years as resident managers of the Arbor Living Center at Eben Ezer Lutheran Care Center in Brush.

Darrell was predeceased by his wife. He is survived by his children, Patricia Cummings '80, Mary Cummings, Julie Castle, Teresa Young, Nancy Wilkinson, Kathleen Chastain, Paul, Michael, John, Robert and Thomas; brother Ronald; 33 grandchildren; and 26 great-grandchildren.



ARCHIE L. CARVER '43 of Grand Junction, Colo., died April 21, 2012. Archie was born in 1917, and attended school in a two-room schoolhouse in Cameo,

Colo., through ninth grade. He finished high school in Palisade, Colo., and then attended Mesa College (now Colorado Mesa University) in Grand Junction, Colo. A member of Sigma Nu fraternity at Mines, he graduated with a professional degree in metallurgical engineering, and went on to serve in the Pacific Theater with the U.S. Navy during World War II.

Archie worked for several years during

the uranium boom as a mining engineer for Union Carbide near Uravan, Colo., and Grand Junction, and later moved to Denver with his wife, Rose, to work for the U.S. Geological Survey. In retirement, Archie and Rose lived in Arvada, Colo., and Grand Junction. He was a member of the President's Council at Mines for one year as well as the Society for Mining, Metallurgy & Exploration and the Masonic Lodge. Rose, as well as Archie's brother, John Carver '48, predeceased Archie. He is survived by his sister, Dorothy Hines.



ROBERT F. CONNOR SR. '40 of Denver, Colo., died October 5, 2011. Born in 1917, Bob

earned a professional degree in metallurgical engineering from Mines, where he was a member of Sigma Nu fraternity. In addition to serving in the U.S. Air Force in Dayton, Ohio, Bob was chairman of Slattery & Co., a plumbing and HVAC contractor. He was also a member of the Equestrian Order of the Knights of the Holy Sepulchre of Jerusalem. Bob was predeceased by his wife, Patricia. He is survived by his children, Robert, Patricia and John; seven grandchildren; and three great-grandchildren.



DONALD I. DICKINSON of Golden, Colo., died January 28, 2013. Born in 1927, Don was a professor emeritus at Mines; he taught in the Department of

Humanities and Social Sciences (now the Division of Liberal Arts and International Studies) from 1970 to 1997, having received a bachelor's degree in English at Colorado State University and a master's degree in history of the English language from the University of Michigan. Don was a leader in the field of teaching English as a second language and traveled extensively on teaching and administrative missions. He received the Mines Medal in 2000, and the Carol and Don

Dickinson Sculpture Garden at Foothills Art Center in Golden was named in the couple's honor. Don is survived by his wife, Carol—his fellow traveler and a teacher—and by his daughter, Lauren.

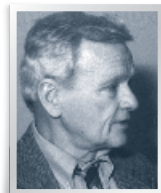
GERALD L. FITZPATRICK '63 of Issaquah, Wash., died January 23, 2012. Born in 1940, Jerry spent his youth exploring the Ohio countryside, hunting and fishing, and developing a lifelong interest in science. He graduated from Mines with a professional degree in geophysical engineering, later pursuing graduate studies in physics at the University of Denver. He specialized in applied physics, conducting government and industry-sponsored research in a variety of fields, and held a number of U.S. and foreign patents. Jerry also immersed himself in the study of elementary particle physics in an attempt to address questions relating to the fundamental nature of matter. He is survived by his wife, Priscilla; son Mark; granddaughter Abigail; step-grandchildren Emily and Will Eddington; sister Karen McNamee; and brother Jay.



ROBERT E. FRANCE '36 of New Orleans, La., died February 7, 2013. Born in 1916, Bob graduated with a professional degree in petroleum engineering from

Mines, where he was a member of Kappa Sigma fraternity, Tau Beta Pi, the Press Club and The Oredigger staff. A World War II veteran, he retired as a colonel in the U.S. Army Reserve in 1976. He enjoyed a 30-year career with Chevron, retiring in 1979. Bob was a member of the President's Council at Mines for many years as well as a Century Society member, and in 2005 he received Honorary Membership in the alumni association. He and his wife, Marie, were members of East Whittier Presbyterian Church in Whittier, Calif., for 41 years and St. Charles Ave. Presbyterian Church while they lived in New Orleans. Bob was predeceased by his wife and his granddaughter, Laurel France; he is survived by his

sons, Michael, Peter, Timothy and Bruce; seven grandchildren; 15 great-grandchildren; and three great-great-grandchildren.

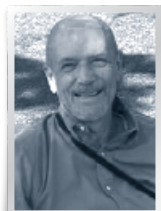


JOHN A. HOGAN of Golden, Colo., died February 13, 2013. Born in 1928, John was a professor emeritus, having taught at Mines 1968–2003. He earned degrees from the University of Cincinnati and Lehigh University.

His contributions to promoting the arts at Mines were considerable. He founded Mines Little Theatre in 1971 and, seven years later, co-founded High Grade, the student arts journal. A longtime member of the Board of Student Publications, John also advised the editorial staffs of *The Oredigger* and *Prospector*.

John loved sports, football in particular. One record he set while playing quarterback for Purcell Marian High School in Ohio wasn't broken until Roger Staubach, destined for NFL stardom, played for the school more than 12 years later.

At Mines, John served as the faculty athletics representative for 31 years. He was elected president of the NCAA Faculty Athletics Representatives Association and served on the NCAA Division II Steering Committee. He helped establish, and then chaired, the CSM Faculty Oversight Committee on Sports and Athletics, and was appointed chair of the CSM President's ad hoc Committee on Sports and Athletics. He also served as an NFL football scout for the Bengals, Bills and 49ers. In 2003, he was awarded the Mines Medal and retired, although he continued to teach part time for several more years. He is survived by his children, John Hogan, Molly Hogan and Anne Yarim, and three grandchildren.



J. DOUGLAS INGRAM '67 of Tucson, Ariz., died March 28, 2012. Born in 1944, Doug enrolled at Mines in 1964 as a transfer student from the University of Arizona. A member of Beta Theta

Pi fraternity, he graduated with a professional degree in metallurgical engineering and later earned a MBA from Lesley College. He also played baseball at the University of Arizona and was a runner for much of his life.

Following graduation, Doug was commissioned as a second lieutenant in the U.S. Air Force and rose to the rank of

captain. After his discharge, he had a 40-year career in engineering, selling and managing for operating, manufacturing, engineering and construction companies related to the mining industry, including Marion, Kaiser Engineers, TIC, Bateman Engineering, New Mexico Public Service Company and Bucyrus International. Among his roles with Bucyrus, he served as manager of operations in Peru for several years. Doug married Kathleen Barry in 1967 and together they had two daughters. He is survived by his second wife, Ann Emerich; daughters Christie and Meghan; and three grandchildren.



GEORGE V. KELLER of Golden, Colo., died April 17, 2012. Born in 1927, George began teaching at Mines in 1960, remaining until 1993, when he retired as professor emeritus.

Head of the Department of Geophysics from 1974 to 1983, his principal area of interest lay in the development and application of electrical geophysical exploration technologies.

After serving in the U.S. Navy from 1945 to 1946, George earned bachelor's, master's and doctoral degrees in geophysics from Pennsylvania State University. He worked for the U.S. Geological Survey 1952–1963, in addition to consulting for several government agencies. He served on President Lyndon Johnson's Blue Ribbon Committee on Mine Safety and President Jimmy Carter's Energy Research Advisory Board.

George published more than 200 papers and seven books, and was a translator for Russian books and journals. He also received a U.S. patent in 1996 related to his research on the detection and identification of handguns. Predeceased by his first wife, Amber, George is survived by his second wife, Liudvika, and his children, Steve and Susan.



JON D. KENNEDY '56 of Benicia, Calif., died April 1, 2010. Born in 1934 in Denver, Jon earned a professional degree in geological engineering from Mines, where he was a member of Beta Theta Pi fraternity. He worked as a civil and geological engineer for the U.S. Forest Service for more than 42 years and was registered as a professional state forester. Several years prior to his retirement, Jon worked as a liaison between the Forest Service and

the governor's office in Sacramento. After his retirement, he did volunteer consulting on a number of committees for the city of Benicia. He played the organ and the accordion. Jon is survived by Lee, his wife of 40 years; daughters Laurie Furen Emery, Susan Jameson and Linda Bennett; son Doug Kennedy; 13 grandchildren; and three great-grandchildren. Jon was predeceased by his sons, Mark and Jerry Furen.



STEPHEN F. KULINSKI '94 of Kamloops, British Columbia, died January 6, 2013. Born in 1968 in Denver, Steve was six when his fascination for geology was ignited

by a collection of fluorescent rocks he found in a mineral shop during a family vacation to Mesa Verde National Park in Colorado.

Steve transferred to Mines after studying geology at CU Boulder for two years. After graduating with a bachelor's degree in geology and geological engineering, he worked for Summit Drilling in Colorado and Wyoming before being recruited by Newmont and moving to Elko, Nev. He later became senior geologist at Barrick's Meikle mine, also in Elko, before moving to Whitehorse, Yukon Territory, where he worked at the Minto mine as chief geologist. In late 2011, he joined New Gold as chief geologist of its New Afton mine in Kamloops.

President of the Northern Nevada Geological Society for two terms, Steve helped launch the construction of the Peace Park in Elko, designing a wall that tells the history of mining and its impact on the town. Steve is survived by his wife, Kristel; daughter Cerra; son Zachary; parents Kathy and Phil; and his grandmother, Felima.



You can read more about Steve and his love of geology at minesmagazine.com/kulinski.



JAMES M. LINK '59 of Highlands Ranch, Colo., died December 12, 2012. Born in 1932, Jim served in the U.S. Army in Korea from 1953 to 1955 before attending Mines. After earning

a professional degree in geological engineering, he worked as a field geologist for United Fruit in Panama, Costa Rica and Nicaragua. He was an engineer for Kermac Nuclear Fuels, working in an underground uranium mine in

New Mexico, followed by seven years as a mining engineer and supervisor for Monsanto in an open-pit phosphate mine in Idaho. From 1978 to 1985, Jim was the director of the exploration and mining division of the Colorado School of Mines Research Institute. He then started a consulting company, James M. Link, Inc., which operated until he retired in 1999. He served on the boards of the Colorado School of Mines Alumni Association and Foundation from 1974 to 1979, including a term on each as president. Jim was a member of the President's Council for nearly two decades, and served as an alumni association mentor. He is survived by his wife, Margaret; two children, Adrienne and Bruce; and two grandchildren.



PHILIP L. LONDON JR. '56 of Golden, Colo., died February 8, 2013. Born in 1927, Phil joined the U.S. Navy at the end of World War II and served in the South Pacific. After military

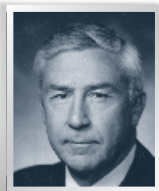
service, he attended Mines on the G.I. bill, earning a professional degree in geological engineering. He then took a position at the U.S. Bureau of Reclamation at the Federal Center in Lakewood, Colo., where he worked in concrete design and testing for major dams, primarily in the western United States. In addition, Phil was a contributor to the U.S. Bureau of Reclamation's water desalination processes based on work he did at a test site in Erie, Colo., which assisted ranchers with remediation of brackish water for livestock. He later co-founded an engineering consulting company in Jefferson County, where he worked largely on government contracts in the 1960s and early 1970s. In 1974, he earned a master's degree in curriculum and supervision from the University of Denver and taught chemistry, physics and science in public schools in Oregon and Colorado. He is survived by his wife of 59 years, Sally; son Dale London '87; daughter Lisa; and granddaughter Madison.



JOHN H. MASON '49 of Boise, Idaho, died January 5, 2013. Born in 1924, John grew up in Golden, where his father, John Mason, was Mines' head football coach. He was

drafted during his first semester at Mines and served in Europe during

World War II, where he participated in the Battle of the Bulge. After the war he returned to Mines, where he joined Blue Key, Beta Theta Pi fraternity and Sigma Gamma Epsilon, and earned a professional degree in metallurgical engineering. John was commissioned a second lieutenant in the U.S. Army after graduation and went on to serve in the Korean and Vietnam wars. He retired as a full colonel from the U.S. Army Corps of Engineers in 1976. His many decorations include The Distinguished Service Medal, The Legion of Merit, The Soldier's Medal and three Bronze Stars. John taught ROTC at Mines from 1959 to 1962 and assisted Fritz Brenneke as a volunteer football coach. He is survived by his wife of 65 years, Reta; his children, Tim, Mike and Mary; five grandchildren; and nine great-grandchildren.



THOMAS C. MOSELEY '47 of Salt Lake City, Utah, died December 21, 2012. Born in 1921, Tom was awarded a four-year scholarship to attend Mines, where

he earned a professional degree in petroleum refining engineering. As a student, he was a member of Sigma Gamma Epsilon. From 1943 to 1946, he was on active duty in the U.S. Army Corps of Engineers, followed by a decade in the U.S. Army Reserves. He resigned as a captain. His professional career included working for Texaco, the U.S. Bureau of Mines Oil Shale Project, Chevron Research and American Gilsonite. He was a member of the American Institute of Mining, Metallurgical & Petroleum Engineers, and supported Mines as a member of the President's Council for one year. Tom was predeceased by his grandson, Matthew Holland. He is survived by his wife, Jean; daughter Rebecca Felton; son Craig; four grandchildren; and three great-grandchildren.



JAMES W. NEWELL '52 of Richardson, Texas, died January 10, 2013. Born in 1926, James served in the U.S. Navy in the Pacific during World War II. He

earned a professional degree in geophysical engineering from Mines, where he was a member of Kappa Sigma fraternity and played varsity tennis. James was a geophysicist with Sun Oil for 40 years; he was also a member of the Society of Exploration Geophysics, the National

Model Railroaders Association and Great Northern Railway Historical Society. He is survived by wife, Lola; sons Thomas and David; daughter Paula Halford; niece Catherine Bedwell '84; and two grandchildren.



WILLIAM G. PARK '49 of Harrisonburg, Va., died November 28, 2012. Born in 1923, Bill served in the U.S. Navy during World War II and in the U.S.

Army during the Korean War. He graduated from Mines with a professional degree in geological engineering and participated in ROTC while at the school. His first job after Mines was party chief of the mud-logging and core-analysis truck for Petroleum Service. He then spent just over two years on active duty with the U.S. Army Corps of Engineers. From 1953 to 1962, Bill performed civil engineering, geological and research work for El Paso Natural Gas, before beginning a 23-year career with the Department of Energy. After becoming an independent consultant in 1985, he was able to find more time for his hobbies of gardening, fishing and hunting. Bill was predeceased by his wife, Norma, and his daughter, Patricia Reilly. He is survived by his sons, Kenneth, Richard and Michael; 12 grandchildren; and 10 great-grandchildren.



JOSEPH J. REBECK '53 of Evergreen, Colo., died November 6, 2011. Bud, as he was known, was born in 1931. He earned a professional degree in mining engineering from Mines,

where he was a member of Sigma Phi Epsilon fraternity and played varsity football. The 1951 team, of which he was a member, was inducted into Mines' Athletics Hall of Fame in 1999. During his career, Bud worked for Williamson Shaft Contracting and Standard Lafarge. He enjoyed excursions into the mountains accompanied by one of the eight beagles he owned over his lifetime. He was named Kiwanan of the Year several times. Bud and his wife, Linda, played bridge and owned season tickets to the Denver Broncos for many years. He is survived by his wife; sons Paul and Mitchell; daughter Jennifer; and three grandchildren.



NORMAN R. ROWLINSON '52 of Houston, Texas, died December 11, 2012. Born in 1929, Norm studied chemistry at Ripon College in Wisconsin from 1947

to 1949, and then transferred to Mines to earn a professional degree in geological engineering. From 1954 to 1956, Norm served in the U.S. military before earning a master's degree in geology from University of Colorado Boulder in 1957. Norm was an independent petroleum geologist for U.S. oil companies in Bogota, Colombia, where he ran his management consulting firm, Minandina, for 40 years. During this time he founded an oil exploration company, Petrolinson. In 35 years, he drilled 14 consecutive dry holes until, in the mid-1990s, he successfully located an oil field with minimum estimated reserves of 350 million barrels. In 1997, he sold Petrolinson to Seven Seas Petroleum and returned to the United States.

Norm was a member of the President's Council at Mines for several years and, in 2000, established the Rowlinson Endowment for Faculty and Staff Enhancement and Student Scholarship Fund. He is survived by his brother, David.

To watch a video tribute to Norm recorded at his memorial service, go to minesmagazine.com/rowlinson.



WILLIAM H. RUEHLE '52 of Denton, Texas, died January 27, 2013. Bill was born in 1928 in the silver mining camp of Rosario, Honduras, to American parents. He earned a professional

degree in geophysical engineering from Mines, where he was a member of Beta Theta Pi fraternity and the varsity track and field team. Entering UCLA in 1959, Bill received a doctorate in physics and later did advanced studies at Southern Methodist University.

In addition to serving in the U.S. Navy as an aerographer in Hawaii, he worked for Mobil Oil for 37 years, starting as an engineer on seismic exploration crews, and culminating with the position of chief geophysicist for exploration and production. Bill led projects worldwide and was an innovator in the field of oil exploration and production, with 30 patents to his credit. He is survived by his wife of 58 years, Joan; daughter

Catherine; sons Patrick, Kevin, Matthew and Bill; and eight grandchildren.



MARLOW E. SHARPE '49 of Roswell, N.M., died December 27, 2012. Born in 1924, Marlow grew up in Haxtun, Colo. In 1942, he enrolled at Mines, which he attended for one

year, before joining the Army Air Corps. After his discharge in 1945, he returned to Mines, where he joined the rifle team and completed his professional degree in geological engineering.

He joined the Bureau of Mines following graduation, and in 1950 he met and married Barbara Small. They spent their first year together in Leadville, Colo., before returning to the family farm in Haxtun, when his brother went to Korea. They remained in Haxtun, farming and running an earth-moving business focused on conservation construction. In 1982, he retired to Nogal, N.M., to pursue his hobbies of prospecting, recreational gold mining in the family mine, and jewelry making. Marlow was a member of the President's Council for one year. His wife of 62 years, Barbara, died in March 2013. He is survived by his daughters, Judith Brazie '75 (married to Mike Brazie '75, MS '79) and Paula Greer, and two granddaughters.



DAVID A. TABASKA '84, '86 of Breese, Ill., died February 11, 2013. Born in 1962, Dave earned bachelor's degrees in

chemical engineering and petroleum refining, and mathematics from Mines, and went on to earn an MBA from the University of Maryland. He worked in computer maintenance for the U.S. Census Bureau, and was a member of St. Dominic Church in Breese. He enjoyed studying the Revolutionary War, Civil War and World War II. Dave is survived by his parents, Gerald and Ursula, and his brother, Jack.



DEAN F. THORPE '48 of Syracuse, N.Y., died January 28, 2013. Born in 1922, Dean graduated with a professional degree in metallurgical engineering from

Mines, where he was a member of Sigma Phi Epsilon fraternity. His college years were interrupted by World War II, when he was stationed in the Philippines as a captain in the Army Corps of Engineers and earned a Bronze Star. After working as a metallurgical engineer for more than 40 years, Dean retired from Parsons Engineering in Pasadena, Calif. A member of the Unitarian Church, he enjoyed music and sang in several community groups and choirs. Dean was predeceased by his first wife, Ann. He is survived by his second wife, Anne; sons James and Jon; two grandchildren; stepchildren Elizabeth Shahan and Jonathan Weinstein; and four step-grandchildren.

ALSO REMEMBERED

GERALD R. BOND '50	January 11, 2012
JACK D. GRAY '52	June 9, 2011
JEFFREY J. KNAEBEL '63	January 26, 2011
JAY L. KRATZ '63	November 4, 2009
TODD M. LASNIK '82	September 29, 2012
CHRISTOPHER K. LOOMIS '69	March 7, 2010
LOUIS W. MINTURN '37	November 25, 2009
FRANK L. NATTA '73, MS '75	March 30, 2012
EARL H. RAMSEY '50	September 16, 2011
DON L. SAWATZKY Dsc '67	May 10, 2012
RICHARD R. STORM '53	April 2, 2009
HAROLD C. TEMPLETON '39	April 30, 2009
JERRY E. THOMPSON '71	March 31, 2010
BORIS S. VOUKOVITCH '51	March 2, 2009
THOMAS E. WILSON '48	April 10, 2006
THOMAS C. WOODWARD MS '50	April 5, 2010
LEONARD E. WYNN '57	May 6, 2006
JOHN R. ZIEGLER '68	May 26, 2012

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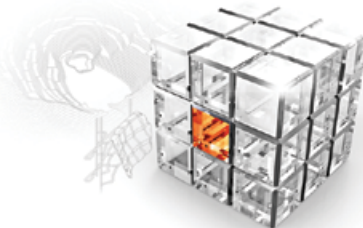
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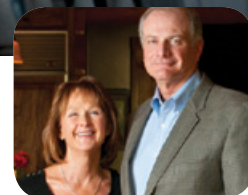
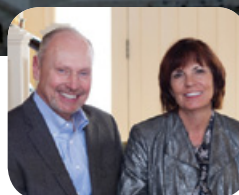
An important member of the team bringing you *Mines* magazine is Eric Hansen '92, photographed here with press operator Sam Hartman. Eric is our primary point of contact at American Web, which is owned by Eric's family and has been printing the magazine for the last 18 years. This photo was taken by sophomore Chelsea Panos during a press check in February as the spring 2013 issue started rolling off the gigantic press, which took only a few hours to print the 27,500 copies we ordered.

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