

Processing Steel
Marv Kay Stadium
Team Blasterbotica

Fall 2015 Volume 105 Number 3

Mines

COLORADO SCHOOL OF MINES MAGAZINE

First Impressions

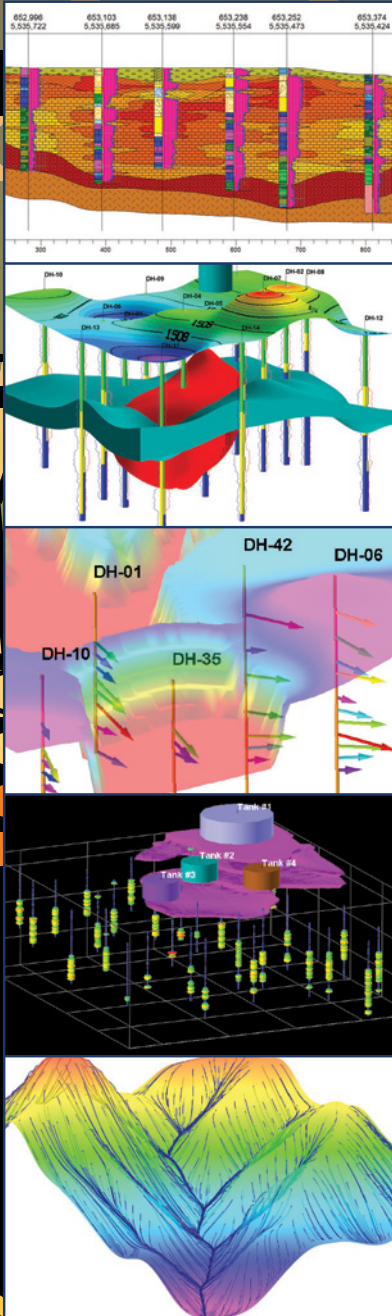
An Interview with
New Mines President
Paul C. Johnson





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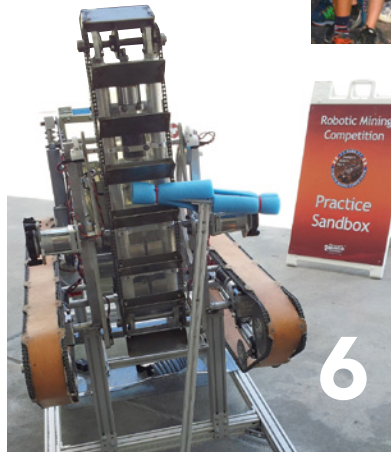
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Cover image: New Mines president Paul C. Johnson on the Colorado School of Mines campus, with Golden's landmark Table Mesa in the background. (Photo by Thomas Cooper)


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 **Humans of Mines** Sharing the story of Colorado School of Mines, one photo at a time. Visit www.facebook.com/HumansOfMines to read stories, advice, and more from Mines students, alumni, faculty, and staff.

 **Journey up Mount Zion, 54 Years Later** Alumni Ed May and Lothar Klingmuller from the class of 1965 hiked up Mount Zion with their 10-pound rocks in this year's M Climb, 54 years after their freshman year at Mines. Watch Fox31's video of the M Climb coverage.

 **In Brief** Mines receives \$1.5M DOE grant for geothermal research | Mines develops app to track gymnasts' performance data | Colorado Geological Survey publishes study on West Salt Creek landslide

 **Marv Kay Stadium Dedication and Opening Football Game** Did you miss the Clear Creek Athletics Center Grand Opening in September? View photos from the weekend-long celebration that culminated in Mines' victory over South Dakota Mines in the inaugural game. See pages 8-9 to read about the stadium.

 **Faculty Member Spotlight** Learn some fun facts about Weimer Distinguished Chair and Geology and Geological Engineering professor, Lesli Wood.

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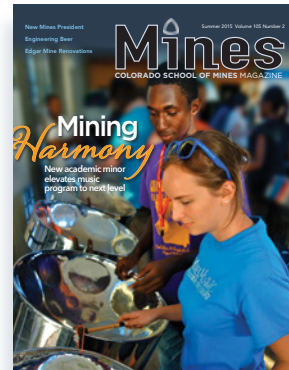
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Comments and suggestions are welcome. Contact us at magazine@mines.edu or *Mines* magazine, PO Box 1410, Golden, CO 80402. To update your address, go to minesalumni.com/update or email jmreeves@mines.edu.

INBOX



ENJOYING MINES MAGAZINE

I've been meaning to write for some time to tell you (and your predecessor) how much I enjoy and appreciate the magazine. It's been my regular link with the school. And each edition brings more news of how Mines is thriving. In this latest issue you had Bill Scoggins' parting words and the long list of Mines' achievements under his leadership. A remarkable legacy! Then the interview with Paul Johnson. Big shoes to fill, and he has a fine background. We're looking forward to meeting him in Houston on August 6th. I like your profiles on Kathleen Smits and Pat Kohl. Lucky student, indeed, to have professors like Dr. Kohl who love to teach and make a science out of how to do it better.

A music minor at Mines! Wonderful! Why not? Engineers can sing and play, too, and music enriches our lives. So does beer, at least for those in the burgeoning craft beer business. Good article on the new "Introduction to Brewing Science" course.

Dennis E. Gregg '50

MINES MUSIC PROGRAM

The latest issue of *Mines* magazine entered the house about 20 minutes ago, and within five minutes a feeling of immense jealousy began to surge through me. The band went to Jamaica and Peru? The choir sang in Rome? You can get a music technology minor? Where-oh-where was all this when I was a student? We got to go to Greeley and Colorado Springs.

I attended Mines from 1971 through 1978, and I was an avid member of the band the entire time. My freshman year was particularly interesting, because I was one of only two flute players—trying to compete with 15-20 trumpets, about 12 trombones, etc. Needless to say, this caused our director, John Shannon, a few

problems trying to find concert pieces that worked well with our instrumentation. By the time I graduated, we were up to about 10 flutes, but we never

could overcome the sheer numbers of the brass section. Personally I thought this was great, since I can only remember one other guy in the section in all those years. (Of course, I did wind up marrying a clarinetist.)

Rich Lemert '78

ENGINEERING A BETTER BEER

Nice article, but I was disappointed to not see any mention of CSM's first brewmaster, Chuck Hahn. Chuck earned three degrees from CSM including a doctorate in Chemical and Petroleum Engineering. I think he graduated in 1970 and joined Coors in 1971. I met Chuck while I was a student at Mines and while he was in charge of the pilot brewery at Coors. I still remember him giving me a private tour of the two-story facility where he got to experiment with how to make beer better. But my best memory is when he brought a test batch to the Kappa Sigma house in the spring of 1974 or 1975. He wanted to get our reaction to a new brew. He insisted we drink it from the dark bottles before allowing us to pour the beer into glasses. When we did, we were shocked that the color, instead of the usual pale yellow was actually amber red! To this day I am convinced that we had just sampled an early version of Killian's Irish Red. Chuck moved to Australia in the early 1980s, made quite a name for himself in the beer industry, and founded the very successful Hahn Brewing Company.

Chuck Fenwick '76

CROWDSOURCING CLEVERNESS

Team Blasterbotica Tests Rover at NASA Competition

Within 15 years an army of robotic rovers could be roaming the red planet, scooping fine, sand-like topsoil (called regolith) and delivering it for processing into materials for human pioneers on Mars. Some regolith may be squeezed of its H₂O to make fuel, propellant, and drinking water. Some may be made into bricks, sidewalk pavers, or radiation shields. The rovers are a critical piece of NASA's plan to have humans on Mars by the 2030s. The more materials we mine there, the less we need to haul from Earth. But one nagging question exists: How will the rovers get around on a planet that has an ash-like surface, one-third the gravity of Earth, and a vacuous atmosphere?

Enter Team Blasterbotica. Since 2008, teams of Mines students have attempted to build a Mars-worthy mining rover for their senior design project. They spend nine months designing, building, and testing it, then load it on a trailer and drive it to Florida for

the NASA Robotic Mining Competition at Kennedy Space Center (KSC). There, NASA engineers look on as 46 teams navigate their creations around craters and scoop regolith at a simulated Martian mine.

"NASA is basically crowdsourcing ideas for robotic machinery that could someday mine materials on other planets," explains faculty co-advisor Ozkan Celik, an assistant professor in mechanical engineering. "This is the frontier of human space exploration, and the students get to be a part of it."

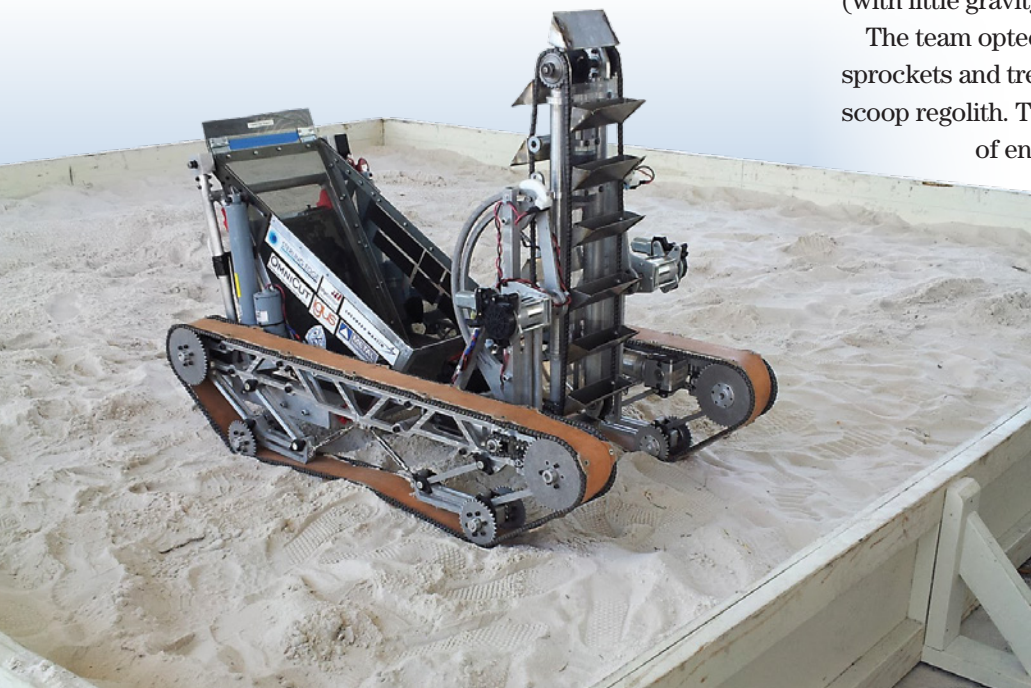
This year's 14-member team built its rover "Jerry" from scratch, with five different subgroups tackling drivetrain, excavation system, regolith delivery, sensing, and controls. Competition rules prohibit substances that "would not function in a Martian environment," which meant no wheels (they sink into the ash-like surface), no hydraulics (the fluid would evaporate in the vacuum of deep space), and no sensing equipment that could be impacted by dust (with little gravity to hold it down, it's everywhere).

The team opted for a tank-like drivetrain made of chains, sprockets and tread, and a lightweight bucket ladder to scoop regolith. Then, they had to build it. "I am not the kind

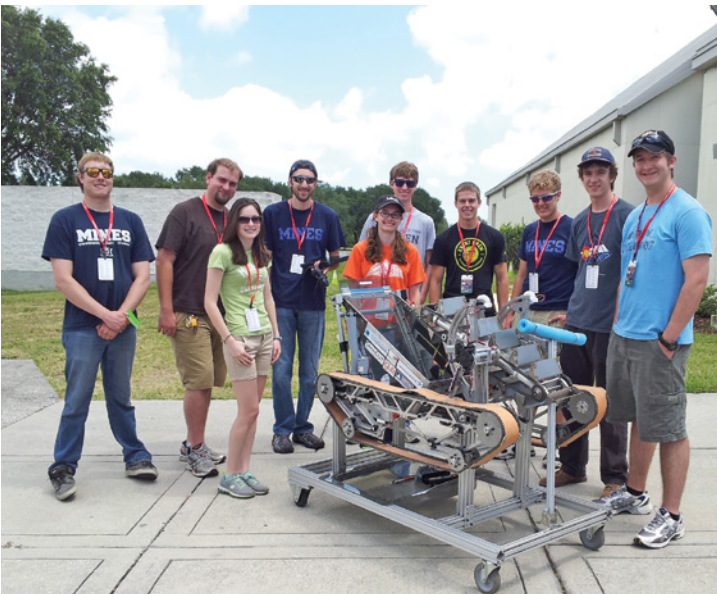
of engineer who grew up tinkering with stuff," says team member Katie Kostecka '15.

"I learned a lot of basics, like how to bolt things together and use a grinder, from my teammates."

At 10 a.m. on May 18, teammates stood sweltering in white protective suits (to protect them from floating particulates) in a KSC arena filled with ash. They looked on nervously as "Jerry" weighed in. "It wasn't allowed to weigh more than 80 kilograms, and



Ozkan Celik



Oskan Celik

it weighed in at 79.5,” says Kostecka.

On the first test run, a problem arose. The regolith was wetter than anticipated and gummed up the drive train, tearing off the chain. So, team members rushed out to buy some toothbrushes and bolted them to the sprockets to continuously wipe away regolith. “It worked remarkably well for something so MacGyver-ish,” Kostecka says.

On competition day the excavation system worked perfectly, but more problems hobbled the rover before it could deliver the 10 kilograms of regolith required to win a design prize. (Fewer than half of competing teams meet this requirement). Still, Kostecka sees the experience as a great success—she learned how to trouble-shoot on the fly.

The Mines team ranked 13th overall and 2nd in the Demonstration and Presentation category. “They knew what they were talking about in front of the judges, and they acted just as you would expect a professional engineering team to act,” says co-faculty advisor Christopher Dreyer, an assistant research professor in mechanical engineering.

For Kostecka, who grew up dreaming of a career in aerospace, the highlight was when a NASA engineer looked at their design, took notes, and spoke of ideas he has gotten from previous teams. “That made me feel like we are part of something bigger—like there is a chance our work could someday have an impact,” she says. “It felt amazing.”

—Lisa Marshall

PRESIDENT'S CORNER

Keeping Mines Special



Thomas Cooper

Since Elyse and I arrived in Golden earlier this year, we’ve had the opportunity to meet hundreds of alumni—from the Class of 1935 to the Class of 2015 and just about every year in between. Whether it was on campus during Alumni Weekend or at a *Mines on the Move* event, we’ve loved hearing about your experiences at Mines, your impressions of Mines today,

and your aspirations for this great university.

I’ve also spent quite a bit of time with the Class of 2019, carrying my 10-pound rock from Arizona up Mt. Zion for my first M Climb, teaching CSM 101 (I learned as much as I taught), and hosting dozens of pizza lunches for students and faculty. They say first impressions are the strongest, and my first impression of Mines was that of a very special community, extending from campus to around the globe and made up of exceptional and engaged individuals having great impact in industry and society in general. Now, with a few months under my belt, I’m even more convinced of the truth of that first impression.

I have learned what makes Mines special to you. It’s the value of hard work and the bond that creates our pride in hard-won accomplishment, the resilience of Mines’ students, Mines’ robust connection to industry, and traditions that are unique to Mines. Those will always remain core values of Mines while we evolve—as we must to remain relevant to the needs of society and to continue to attract those amazing students who best fit the Mines education.

The evolution of Mines is especially evident as I walk around campus. Today, it is a beautiful synergistic blend of old and new, and it reflects our aspirations for the future of our academic programs, the student experience, and our passionate alumni.

As we look to the future, we want to increase the visibility of our alumni, foster meaningful engagement through programs, tap into your ability to inspire our students and provide new opportunities for them, and grow Mines’ reputation. I look forward to working with you on this. If you have ideas and interest, please share them with me at paul.johnson@mines.edu.

Go Orediggers!

—Paul C. Johnson

SPORTS

Rebuilding the West's Oldest Football Stadium

Colorado School of Mines football has long held the distinction of playing in one of America's most historic football stadiums. Now, they'll enjoy playing in one of America's best.

The 2015 season marks the debut of Marv Kay Stadium at Campbell Field, a state-of-the-art home for Oredigger football that completely rebuilds the West's oldest football stadium. Named in honor of long-time coach and administrator Marv Kay, who has spent nearly 60 years in Golden, the stadium and its support facilities put Mines Athletics at the forefront of NCAA Division II.

As the centerpiece of the Clear Creek Athletic Complex, the newly-christened Marv Kay Stadium at Campbell Field will be about more than just football. Within the portion of the facility called the Harold M. and Patricia M. Korell Athletic Center are expansive new spaces for sports medicine, equipment, and strength and conditioning; locker rooms for the track and field and cross country programs; and an entire second level dedicated to office, meeting, and classroom space. The visitor's building between the field and Clear Creek will also be used for visiting teams at the complex's other fields.

All told, the stadium gives Mines more than 60,000 additional square feet of multi-use space—a far cry from the singular purpose served by Campbell Field.

"I'm excited to see the student-athletes' faces when they get in the finished building, and I'm excited to see our fans, alumni, current students, and faculty and staff go to a game and do hopefully many other things in the facility," said David Hansburg, Mines' director of athletics. "It's a great facility, it's first-rate, and I can't thank our donors enough."

One of those student-athletes is senior defensive lineman Emmanuel Graves. The mechanical engineering major from



Tim Flynn



Tim Flynn



Tim Flynn

San Antonio, Texas, has experienced the journey of Mines football from every angle, spending his first few years at the old Campbell Field, then the 2014 season playing “home” games off-campus at a high school field in Arvada, and now the move to one of NCAA Division II’s premier stadiums. “I think it’s going to be surreal, a dream come true,” Graves said. “I’ve been looking forward to this moment for the longest time. There are a lot of previous seniors who never got that, and that’s why I feel grateful.”

The new stadium has been a long time in the making. Football has been played on the site since 1893, and grandstands and new grass were installed in 1922 in what was named Brooks Field. Artificial turf went down in 2010, and the stadium was named Campbell Field in honor of Harry D. Campbell. Over its 122-year history, the stadium also played host to Mines baseball and soccer, along with training camps by the Denver Broncos and Baltimore Colts and, for a time, even minor-league baseball.

The decision to dedicate the stadium in Kay’s honor wasn’t a hard one to make. The 1963 Mines graduate coached Oredigger football for 24 years and served nine more as athletics director. A member of both the Mines Athletics and Rocky Mountain Athletic Conference Halls of Fame, the former mayor of Golden now serves as a development consultant for the Mines Foundation. His decades of service to Mines is unmatched.

“The day I saw Marv’s name on the stadium, I just had this giant smile from ear to ear,” Hansburg said. “You don’t often see people who commit a lifetime to one institution, it happens so infrequently anymore. Marv’s love for Mines knows no bounds.”

The Clear Creek Athletics Complex project—which includes the Stermole Soccer Stadium, Stermole Track & Field Complex and Crouch Field Events Center, and improvements in and around baseball’s Darden Field and the Mines Softball Field—cost an estimated \$26.3 million, with the project funded nearly entirely by private donations. It was kick-started in 2012 with leadership gifts from alumni, including \$1 million investments from Steve ’64 and Dollie Chesebro and Rob ’68 and Ann McKee. Harold ’68 and Patricia Korell committed \$4 million to the project, naming the athletics center within the facility. Many more alumni and friends of Mines have since contributed to the project, including Southwestern Energy donating funds for a new scoreboard.

All of that adds up to a game day experience that Graves knows will help the Orediggers succeed on the field. “I think people are going to see that we have a winning tradition and that we have a football program that’s pretty successful,” he said. “When you have more support from the fans, you have more energy to play because you have all these people depending on you to represent your school in the best way you can.”

—Tim Flynn

For more on Mines athletics, visit csmorediggers.com.

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INVESTING IN PUBLIC POLICY

Payne Institute for Earth Resources Named

Colorado School of Mines' premier policy institute for earth resources has a new name: the Payne Institute for Earth Resources. Thanks to a \$5 million investment by Jim '59 and Arlene Payne, the institute will move forward with plans to expand its leadership and reach. The Payne Institute will educate and inform policymakers and other stakeholders about pressing issues in the areas of earth, energy, and the environment and will foster collaborative partnerships with established research institutions, universities, and government agencies around the world.

Originally established as the Earth Resources Institute in 2014, the Payne Institute is a natural fit with Mines' specialized expertise and its dedication to serving industry and society since its founding in 1874. The new investment not only renames the organization, but also enables the Payne Institute to propel its growth and enhance Mines' role as a global public policy leader in these focus areas.

"My vision is to leverage the institute's first-class academic research and have it serve as the go-to resource for those engaged in public policy discourse on some of the challenges shaping our future," said Jim Payne, who earned his professional engineering degree in geophysics from Mines in 1959.

The Payne Institute is a campus-wide initiative, led by Mines' Division of Economics and Business and the Office of the Provost. "The Payne Institute provides Mines an institutional base from which to leverage a rich set of faculty resources across campus," said division director Michael R. Walls, who is spearheading the effort. "Mines is already known as one of the nation's top engineering and applied science universities, and the Payne Institute will open a wealth of opportunities to expand our innovative and influential quantitative analysis in the policy arena."

Research at the Payne Institute will promote analysis based on sound economic and scientific principles. Areas of



From left: Mines Foundation President and Chief Operating Officer Brian Winkelbauer, Provost and Executive Vice President Terry Parker, Jim '59 and Arlene Payne, and President Emeritus Bill Scoggins.

research will include rare earths and critical materials, climate and carbon policy, pollution regulation, global trade and the environment, minerals policy, and energy security.

Mines will host the Payne Institute's first Distinguished Lecture event featuring Adam Sieminski, administrator for the U.S. Energy Information Administration, on October 29, 2015. Other upcoming initiatives include the development of a topics-based annual conference in February 2016, a Visiting Scholars program, a search for an institute director, a comprehensive set of policy briefs, and collaborative research initiatives both within the university and with external research partners.

Jim Payne retired as the CEO and chairman of Shona Energy Company in 2013 and was previously the chief executive of several companies, including Nuevo Energy Company, Santa Fe Snyder Corporation, and Santa Fe Energy, following a career with

Chevron Oil. He has served as chairman of the Domestic Petroleum Council and the Offshore Energy Center, as well as a board member of the American Geological Institute Foundation. In addition, Payne has served as an outside director on several service industry boards. He and his wife, Arlene, split their time between Pagosa Springs, Colorado, and Fredericksburg, Texas.

—Rachelle Trujillo



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FACULTY SPOTLIGHT

Lesli Wood: Geology and Geological Engineering Professor

Lesli Wood grew up running around the hills and creeks of central Arkansas. By the time she was a junior in high school, she already knew she wanted to major in geology at Arkansas Tech University.

“We backpacked several times through the Wind River Range in Wyoming, and we camped in the Medicine Bow Mountains,” she said. “I was immersed in nature and looked for an occupation that would allow me to be in nature. I also grew up liking mysteries. Geology is the study of the mysteries of earth and other planets, so it was the perfect science.”

Wood received her master’s degree in geology from the University of Arkansas and her PhD in earth resources from Colorado State University. In 1992, she began working at Amoco Corporation in Texas. Her position coincided with the company’s revolution in paleo-landscape imaging through the development of coherency and spectral decomposition. It was there that she began to appreciate geomorphology—Marian deltas; deep-water landslides and sedimentation processes; and fluvial, deltaic, and shallow marine sands and reservoir systems.

Before she came to Mines, Wood spent 18 years working as a senior research scientist at the University of Texas, where she ran a consortium called the Quantitative Clastics Laboratory. Today, this research program runs at Mines under the title of Sedimentary Analogs Database and Research Program.

“I have had the good luck to supervise more than 45 graduates; do field work in Barbados, Trinidad, and the United States; and work with spectacular 3D seismic data in basins all over the world, including Indonesia, India, Morocco, New Zealand, and the offshore United States,” she said.

When Wood isn’t researching shale tectonics and mud volcanoes, she is

practicing with her band, The Spice Boys, or creating her own music. Her move to Golden coincided with the band’s fourth appearance at the American Association of Petroleum Geologists Annual Convention and Exhibition meeting last summer. It was during those acoustic folk performances that she began to make connections with other Mines professors. When she saw the job posting for the Robert Weimer Distinguished Professor of Sedimentology and Petroleum Geology at Mines, applying for it was a no-brainer.

“I thought, ‘you’re never going to get an opportunity with this again.’ If you graph quality versus size, Mines goes so far up the chart,” she said. “This is probably the highest quality school there is for its size in the world.”

Wood began working at Mines in January; six months later she traveled

(also known as Upper Carboniferous or Late Carboniferous). “There’s an area that’s been well studied for decades called the Jack Fork Formation,” she said. “As this huge basin began to fill up, the Jack Fork was on the bottom and a unit called the Atoka was on the top. We’re mainly studying the Atoka, because we can mine information that’s been collected from the Jack Fork and compare those two systems to see how their architecture differs.”

Most recently, Wood has been fascinated with researching sea-floor landslides. “Up to 70 percent of the fill in some of the ocean basins around the world consists of huge landscape deposits,” she said. “Some of the largest tsunamis that happen in the world are because of landslides that perturb the seafloor. As companies explore the ocean floors, we have to be concerned with a lot of natural hazards,

including landslides, as well as concern ourselves with the impact we can have on the seafloor.”

Wood hopes to integrate her own research in submarine landslides with that of her colleague Paul Santi, professor in Geology and Geological Engineering at Mines, who has immense expertise in subaerial landscapes (mountain landslides).

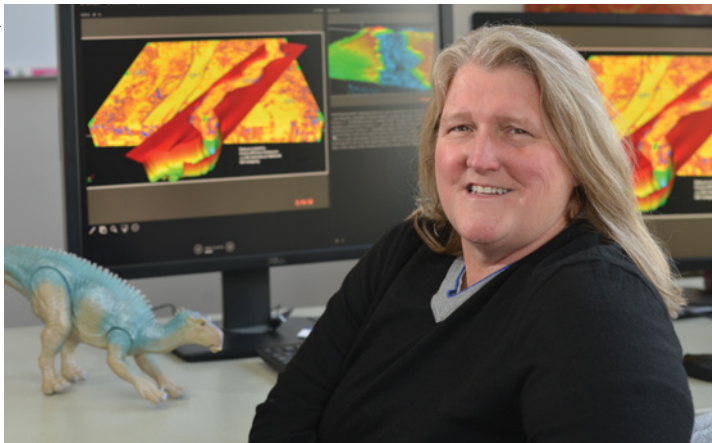
“I always felt like those studying ocean landslides

and those looking at subaerial landslides could learn a lot from one another,” she said. “I think it’s going to be a very productive relationship and an opportunity to set Mines apart from other institutions. I’m looking forward to that.”

Wood is teaching three courses at Mines this fall: Seismic Geomorphology, Integrated Petroleum Exploration and Development, and Engineering Terrain Analysis.

—Kathleen Morton

Thomas Cooper



to Malaysia with PhD student Hirofumi Kobayashi to study the fold belt in offshore Borneo. Wood and Kobayashi also spent a few days with Japan’s largest oil and gas exploration and production company, INPEX, analyzing their data, talking about the wells they were interested in drilling, and teaching a three-day short course.

Wood also has two graduate students doing field work in Arkansas. Pengfei Hou and Hang Deng are collecting outcrop data in the Ouachita Mountains, researching an ancient ocean system that existed there around the Pennsylvanian time

Visit Wood’s band website at hazelberrymusic.com or read her blog at worldofroc.blogspot.com.

ENGINEERING ART

From Transmission Chains to Dreamcatchers

Visit student Laine Greaves-Smith in his garage and you'll find him buried in an assortment of sprockets, gears, pipes, bearings, aluminum, steel, and transmission chains. The Mines engineering student uses recycled car parts to create functional art pieces, such as chandeliers, lamps, and vases. Instead of heading to a furniture store, Greaves-Smith, who is studying both mechanical and electrical engineering, sifts through his garage for inspiration and then stacks and welds pieces together to create unique designs. "It's important for engineers to look at problems differently than how they're taught in class," said Greaves-Smith. "I get enough numbers in classes, so this helps me de-stress and use my hands."



Greaves-Smith originally attended Webster University for technical theater design, but he transferred to Mines because he "missed the challenge of advanced courses." Some of his most rewarding experiences, however, have occurred outside of class.

When Greaves-Smith decided to construct a battle axe, he teamed up with Gerald Bourne, a Teaching Associate Professor in the Department of Metallurgical and Materials Engineering at Mines, to study the best way to strengthen the steel. In Bourne's lab, Greaves-Smith created micrographs of the treated and untreated steel to analyze the internal structure of each sample.

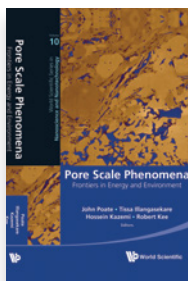
Last fall, Greaves-Smith collaborated with Mechanical Engineering Teaching Associate Professor Robert Amaro to determine the best bearings for all seven moving parts of a table he was building. He then worked in the College of Engineering and Computational Sciences machine shop in Brown Hall to fabricate the precision parts required for the design. "I enjoy using car parts because there are so many beautifully engineered and crafted components inside a car



that most people never see," he said. "By putting these components out in the open as art, more people can appreciate the craftsmanship of each piece and that of my assembly."

In April, Greaves-Smith took third place in Longmont's EcoCreations 6 juried exhibition for his chandelier piece, which was fabricated from bike chains and a bike wheel. In February, he showcased some of his collection at the First Friday Art Walk in Denver. Then in May, he competed with the Blasterbotica team in the NASA Robotic Mining Competition at Kennedy Space Center in Florida, where they placed second in the presentation and demonstration category.

—Kathleen Morton



JUST PUBLISHED

Mines Team Publishes Book on Pore Scale Phenomena

Pore Scale Phenomena: Frontiers in Energy and Environment, a book edited by a team of Mines faculty devoted to understanding the physical and chemical properties of pore scale phenomena, has recently been published by World Scientific. The book provides a comprehensive overview of the interrelationship between engineering and science. Edited by John Poate, emeritus vice president for research; Tissa Illangasekare, civil and environmental engineering professor; Hossein Kazemi, petroleum engineering professor; Robert Kee, mechanical engineering professor; and Luis Zerpa, petroleum engineering assistant professor; the volume is one of the first multidisciplinary books published on the subject, covering the relationship between oil and gas reservoirs; hydrogeology; and materials science, energy, devices, and biology. (World Scientific, 2015).

2015 Philanthropy Awards

Every year, the Colorado School of Mines Foundation proudly presents the prestigious Philanthropy Awards to members of the Mines community. These awards were presented at the annual Evening of Excellence, held in October.



Blakelee Midyett '10, Math & Computer Science

Young Alumni Philanthropy Award

Recognizing outstanding volunteer and philanthropic involvement; available to alumni who graduated 10 or fewer years ago

Not only is Blakelee a President's Council member, but she has increased her giving every single year, providing invaluable opportunities to students on campus. Blakelee, a basketball player during her time at Mines, can be found attending many on-campus events, lectures and games. In 2014-2015, Blakelee served as the Young Alumni co-chair with her brother, fellow Mines alumnus, Michael Midyett, and encouraged her peers to support Mines. Blakelee is the CEO at Golden Software, the leading provider of scientific graphics software in the world.

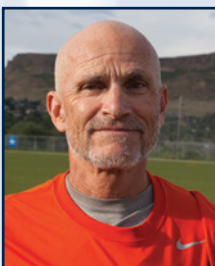


Harold '68 and Patricia Korell, Petroleum Refining

Mines Tourmaline Award

Honoring exceptional philanthropic commitment; available to alumni and friends, based on their cumulative lifetime giving

Harold was a men's basketball student-athlete and has been a longtime supporter of Mines in many areas. Harold and Pat provide support for men's basketball scholarships along with funding for the Clear Creek Athletics Complex, cementing their passion to see Mines advance to the next level with improved facilities for student athletes. Harold, along with Southwestern Energy, generously gifted the lobby in Marquez Hall and was also an early donor to the Outdoor Recreation Center. Harold and Pat created a long-running scholarship that helps students coming to Mines from Wyoming, his home state. Harold has served on the Board of Governors for the Colorado School of Mines Foundation and had a long and successful career in the petroleum industry (retired chairman, CEO and president of Southwestern Energy).



Frank Kohlenstein, Men's Soccer Coach

Faculty/Staff Philanthropy Award

Recognizing outstanding volunteer and philanthropic commitment; available to current Mines faculty and staff

Frank has been the head coach for the men's soccer team since 1998, is a six-time RMAC Coach of the Year and ranks as the all-time winningest men's soccer coach at Mines. He has led the Orediggers to 11 consecutive winning seasons, 15 straight conference tournament appearances and five NCAA postseasons. Along with his coaching duties, Frank is a huge advocate for the Colorado School of Mines Foundation and is currently a President's Council member; he embodies the culture of philanthropy for staff.



COLORADO SCHOOL OF MINES
FOUNDATION



Thomas Cooper

President Paul C. Johnson with his wife, Elyse.

First Impressions



An Interview with New Mines President Paul C. Johnson

Interview by Laurie Schmidt

On June 1, 2015, the Colorado School of Mines Board of Trustees announced the appointment of Paul C. Johnson as the 17th president of Colorado School of Mines. He officially assumed his duties on July 1 and currently resides in the President's House on campus with his wife, Elyse. Johnson joined Mines from Arizona State University, where he served as dean and executive dean of the Ira A. Fulton Schools of Engineering. Two weeks before the start of the fall semester, the editor of *Mines* magazine sat down with President Johnson for a Q&A interview to help alumni readers get to know the new president on a personal level.



Incoming freshmen got a pleasant surprise when new Mines president Paul C. Johnson joined them for the annual M Climb on August 24, 2015.

MINES: What were your first impressions of Mines?

JOHNSON: I've had multiple first impressions of Mines. The initial one occurred when I began working in the oil industry—that one was a distant impression of a specialized, highly technical and smaller university that produced great people in geology and engineering. My next first impression came 30 years later when talking with the search firm and the Board of Trustees and reading the strategic plan. That new first impression was that Mines is an institution that's really eager to take another step in its evolution. You can trace the history of Mines and see steps along the way. The most recent step has been a physical transformation of the campus, and—to some extent—a transformation of the demographics of the faculty. So, the impression that I got before ever stepping foot on campus was that it's almost like somebody has built a new car, it has a great team built around it, and now they're ready to go someplace.

Then I came and visited the campus, and the impression was that of a really close-knit community and a very engaged and

passionate alumni base—just a group of really nice people who care a lot about the institution. What I kept getting was a sense that this is a place that's eager to have its next leader and eager to work with that person to develop and implement the vision for the next decade.

MINES: How did those impressions play into what motivated you to apply for the position?

JOHNSON: The thing that really hooked me was that when people read the position description, their first comment to me was, "they wrote that position description about you." I kept getting that feedback from people. The match was just sort of eerie. Then I looked at the Strategic Plan, and I liked what I saw, in terms of its format and the content. You can sense the core values of an institution when you look at the materials they produce. And you can see that Mines is very student-centric, which is very important to me. It's an institution that's trying to elevate its profile in the world, as well as increase the impact and

“ I’ve always had this rule that to be happy over the course of a week, I need to average about 30 minutes a day interacting with students in some way. Because really, that’s what we’re all about here. ”

scale of its research enterprise—the discovery and innovations. That was something that appealed to me a lot.

I love helping students develop, and I love helping faculty develop, and you can tell that there’s this group here that is ready to take the institution to the next level. So, that was the big attractor to me. And then, of course, all of the other things that come along with that were bonuses. Elyse and I had always said that if we were to ever leave ASU, it would have to be for an opportunity in the West, it would have to be a smaller institution that really cares about students and is interested in changing and evolving, and it would need to be located in a college-town atmosphere. Mines clearly checked every one of those boxes. Finally, I just realized that this might be a once-in-a-lifetime opportunity.

MINES: What will you miss most about living in Arizona?

JOHNSON: For nine months of the year, the weather in Arizona is fantastic. Like Colorado, there is a lot of natural beauty there, if you know where to go to find it. But at the top of the list of things I’ll miss most are the people I worked with there.

MINES: You’ve enjoyed the warm climate of Arizona for quite some time. Does Colorado winter make you nervous?

JOHNSON: It did when we were first thinking about coming here. When I came for my first interview in late February, that day there was a huge snowstorm in Denver. The snow was piled up everywhere, and I was thinking, “Oh no.” But we are really looking forward to experiencing seasons.

MINES: When you were a college student, who was the most influential person in your life?

JOHNSON: In terms of making me realize that being an engineer was for me and getting me interested in education and teaching, it was definitely Steve Whitaker, one of the faculty members at University of California-Davis from my undergraduate days. He showed me that you could solve very abstract problems



President Paul C. Johnson welcomes students at the Fall 2015 Convocation.

Thomas Cooper

as long as you were methodical. He had a great presence in the classroom, but he was not intimidating at all. The really cool thing for me was that he wore blue jeans, and I decided I wanted a job where I could wear jeans all the time.

MINES: What is the best advice you ever got?

JOHNSON: Choose to work with people who are really positive and forward-looking. People sometimes aren’t happy about something, and they want to talk about what happened last week or two years ago. I like to be around people who have fun and are creative, so one piece of advice I got was to basically surround yourself with people like that.

Don’t be afraid to take risks and fail has always been a good piece of advice as well. And make sure you’re having fun with what you’re doing. If you’re not having fun, you’re probably not in the right place or position.

MINES: What would people be most surprised to know about you?

JOHNSON: From an academic standpoint, for some reason people have always been somewhat surprised at how much I teach and how much time I’m willing to devote to being accessible to students and faculty. Most people have this misconception that the higher up you get in a university, the more disengaged you are from the basic function of the institution. Sometimes when I tell faculty members that I teach three classes, their jaws drop. I’ve always had this rule that to be happy over the course of a week, I need to average about



Laurie Schmidt

President Paul C. Johnson talks to incoming freshmen at the Denver Welcome Party, held on August 3, 2015, at Coolbaugh House.

30 minutes a day interacting with students in some way. Because really, that's what we're all about here.

MINES: What inspires you?

JOHNSON: I know I'm inspired if I do something and then come away being really excited. The thing that always does it is helping students—interactions with students and learning what they're really interested in doing. Faculty always inspire me, particularly the ones who are very creative and entrepreneurial and share the same love for students.

Then there are the Mines alumni. In early August, I came away from the Houston alumni event just totally fired up. The event was supposed to go from 6 p.m. to 8 p.m., but we were there until 10:30 p.m.—the security guards had to kick us out. It's very easy to be really excited about Mines when you spend time with the students, faculty, and alumni. You can't help but be inspired by that.

MINES: Do you have a Colorado "bucket list"?

JOHNSON: The list keeps growing, because I keep asking people what to do in Colorado. I'm certainly looking forward to all the Mines traditions, like the M Climb. I also love backpacking and hiking, so I'd like to do some or all of the Colorado Trail. Other things on my list are: going to a concert at Red Rocks, tubing or kayaking on Clear Creek, and seeing Blaster in person. And we keep hearing about bears, so we want to see a bear in Colorado.

MINES: What is the most memorable conversation you've ever had with a student?

JOHNSON: I have had many that are memorable and inspiring. Most recently, at ASU's graduation this year, a student approached me. He came up right before graduation, and he handed me a written note. The short version of it is:

"A little high school kid at ASU's freshman camp who was extremely introverted came up to you and just said, 'Hi.' You started a full conversation with me, and I saw that you genuinely

cared about your students. Look at where I am now—in graduate school and leading that freshman camp. All it took was a small conversation with an unassuming student to help me along my life path."


It wasn't a big deal for me to spend a couple minutes talking to this young man when he was a freshman, but it made a huge difference to him. So, I guess the moral of the story is to never forget that a small gesture can make a big difference to someone.

MINES: What do you see as the biggest challenge facing college students today?

JOHNSON: If there was a short list, affordability would certainly be one of them. In the face of declining public support, more students are working significant hours and are unable to devote the time needed to their studies. The ubiquitous availability of information is another challenge—some students assume that the answer to everything is already somewhere on the internet and will spend hours looking there, rather than spend the 30 minutes needed to work through a problem.

On the plus side, today's students are more likely to be actively engaged in their education. They tend to be more entrepreneurial, and they are fairly good communicators when they come in. Creating ever-evolving learning environments that recognize these challenges and build on student strengths and interests is key at Mines.

MINES: What are you most looking forward to about Mines and the Golden community?

JOHNSON: Getting to know and work with everyone here is at the top of my list. One of the major factors that influenced my decision was the high quality of people at Mines. We are also really looking forward to the Colorado lifestyle. We've always been attracted to small towns, and we love Golden. My wife and I wake up in the morning and say, "We hit the jackpot." 



Thomas Cooper

Reinventing STEEL

Mines Alumni
Test their
Mettle in
Flourishing
Field of
Ferrous Metals
Research

By Lisa Marshall

From his third-floor office at the General Motors Warren Technical Center just outside Detroit, metallurgical engineer Jason Coryell '04 can clearly envision the automobile of the future. It will be made of a state-of-the-art material strong enough to protect drivers through even the most serious of rollovers, yet light enough to slash car weights and double fuel efficiency. It will be easily weldable into dent-resistant panels. It will be recyclable. And it will be cheap enough that cars made of it remain affordable.

What is this miracle material? Chances are, you've heard of it.

"At the end of the day, we still think that for most vehicles, steel is the material of choice," says Coryell, a technical integration engineer with GM. "But in order to keep it the material of choice, we have to keep innovating."

Coryell is among the dozens of Mines alumni who did their graduate work at the Mines Advanced Steel Processing and Products Research Center (ASPPRC) and have since gone on to use their unique skills to help move the ubiquitous, centuries-old mix of iron and carbon into the modern age. Some are developing wave-resistant steels for offshore oil rig platforms or high-tech alloys able to withstand increased pressure and corrosion inside gas pipelines. Some are working on innovative steels to make lighter, stronger windmill towers and gear boxes. Others are striving to make chainsaw blades used by loggers and firefighters last longer.

Then, there is automotive research. With new federal guidelines calling for a fleet-wide fuel efficiency average of 54.5 miles per gallon—up from 25.4 today—by 2025 and new standards that require a car’s roof to withstand three times its weight in a rollover, the push is on to come up with materials that are at once ultra-strong and ultra-light.

As one of the most plentiful and inexpensive materials out there (and one with a track record that dates back 4,000 years), steel is top of mind among carmakers. And the ASPPRC, a unique industry-academia collaboration focused almost entirely on ferrous metals, is thriving. “There is more excitement around steel research now than I can ever remember,” says ASPPRC’s director John Speer. “More than half of the steel grades today were not even available 10 years ago.”

A ONE-OF-A-KIND COLLABORATION

Mines emeritus professors David Matlock and George Krauss founded the center in 1984, at a time when universities, government research facilities, and corporate research and development (R&D) departments were shifting their focus away from steel toward more exotic materials. Aware of the widening knowledge gap, the National Science Foundation provided Mines with \$550,000 in seed money to form a steel center. Once industry players got wind of the idea, they lined up to become sponsors.

Today, the center boasts 31 members who pay \$67,000 each per year to support graduate research that may someday be of use to their companies. Sponsors include multinational steel makers, like ArcelorMittal (the world’s largest), to energy companies like Chevron, to the center’s newest member, Blount International, which makes farming and logging equipment. Eight Mines faculty lead a team of research assistants, post-docs, and graduate students. In all, more than 200 students have come through the center, and the vast majority now work in steel-related industries.

Seated at the interface between producers and end-product-makers, ASPPRC focuses on developing heat treatments, alloying methods, and other processes to alter the microstructure of raw sheet or bar steel to yield specific mechanical properties.

“You can’t tell looking at these steels that they all have different recipes or chemical compositions, but they do,” says Speer, seated in an office with displays of gears, cans, and car parts that

Opposite page: Graduate student Blake Whitley prepares a Gleeble thermomechanical rolling simulation in Mines’ Advanced Steel Processing and Products Research Center.

Right: Graduate student Oscar Terrazas, Professor John Speer, graduate student Zahra Ghanbari, and Professor Emeritus David Matlock look at sheet steel formability specimens.



Thomas Cooper



This image depicts sheet steel specimens that have undergone formability testing.

students have worked on, and even an elegant two-foot-tall steel flower. “Sponsors specify what they need—what problem they are concerned about—and we try to help them develop new concepts or understand fundamentals that they don’t have time to address.” But Speer stresses that many sponsor companies have impressive R&D departments of their own. “We would never be so presumptuous as to think they couldn’t survive without us,” he says.

But what the center can offer, sponsors say, is a team of nationally recognized ferrous metallurgy experts and graduate students who have the time to mull basic questions that might get backburnered amid day-to-day industry demands. The collaborative nature of its sponsor members, who gather twice a year at Mines to review research, is also unique, says Coryell. “It’s a way for people from across the industry to come out to Colorado in a pre-competitive environment and work toward the same goal: to further steel research.”

RE-IMAGINING STEEL

In January 2014, Ford rocked the automotive world when it announced that its 2015 Ford F-150 truck body would be made of aluminum, shaving 700 pounds off the vehicle’s weight. Headlines predicted trouble for the steel industry, which gets about 26 percent of its business from auto-related companies, according to the American Iron and Steel Institute.

But switching cars to aluminum, carbon fiber, or other lightweight materials isn’t so simple, explains Coryell. With lighter weight often comes less strength, which can compromise safety. Aluminum is significantly more expensive than steel. And if cars were re-engineered to be made from a different material, assembly lines, body shops, and even paints—all of which have been designed around steel cars for decades—would have to change, too.

Yes, Coryell says, some premium vehicles will inevitably

switch some of their parts to other materials, but for the everyday car, it makes more sense to stick with steel and try to make it better. That’s where the ASPPRC comes in. “Higher-strength, higher-ductility steels are consistently being developed, and a lot of that work is being done at Mines,” says Coryell.

One notable example is a process called quenching and partitioning (Q and P), which Speer developed with the help of ASPPRC alumnus Amy Clarke ’06 more than a decade ago. In pursuit of her PhD, Clarke spent four years hunkered down in a lab developing and testing the complex, multi-step process. It starts with basic sheet steel and then uses carefully timed temperature changes to create a new material with a unique mixture of austenite and martensite (microstructures produced at different phases of heating and cooling). The result: steel that is both strong (making it more crash-resistant) and ductile.

“If we can make a strong steel with good ductility we can use thinner sheets,” Clarke says. “By doing that, we reduce weight and can improve fuel economy.” In fact, some estimates indicate that high-strength advanced steels made with Q and P could reduce vehicle weight by 20 percent (even more than the 15 percent achieved by switching to an aluminum body). Numerous companies around the globe, including China’s Baosteel (another ASPPRC member), are now exploring how Q and P can improve their products.

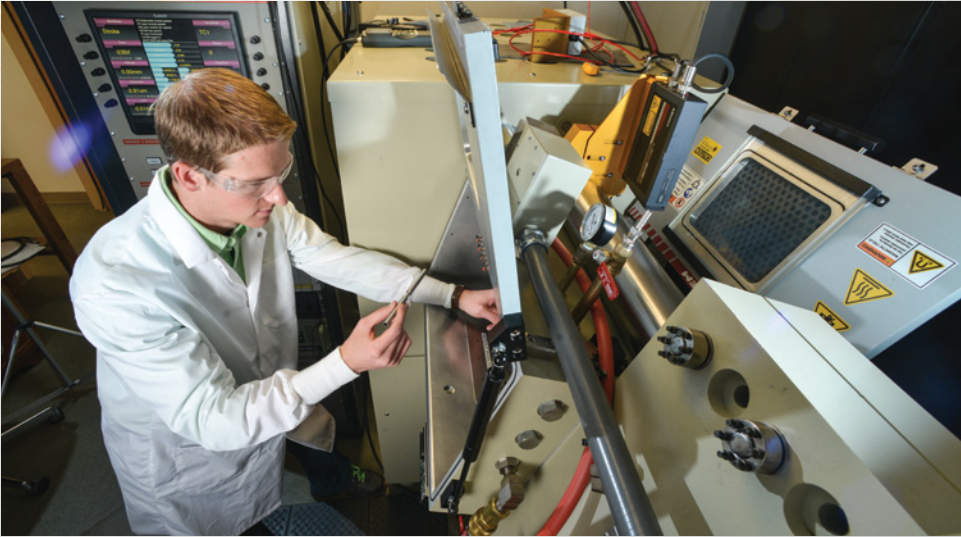
Meanwhile, Clarke has taken the skills she learned at the ASPPRC and put them to work as a scientist at Los Alamos National Laboratory, where she is now working on novel steel microstructures for energy and defense applications. She continues to “team up with Speer and other ASPPRC alumni. “I see them at conferences and we collaborate on different projects. The network built by the sustained activities of the ASPPRC is really amazing,” she says.

PRESERVING A LOST ART

Steve Coryell ’10, Jason’s younger brother, arrived at Mines in 2008, lured by recommendations from both his older brother and his father, a retired metallurgist from American Axle Manufacturing and long-time sponsor of the center. “We view that as quite an endorsement—when a sponsor representative sends us their children,” says Speer.

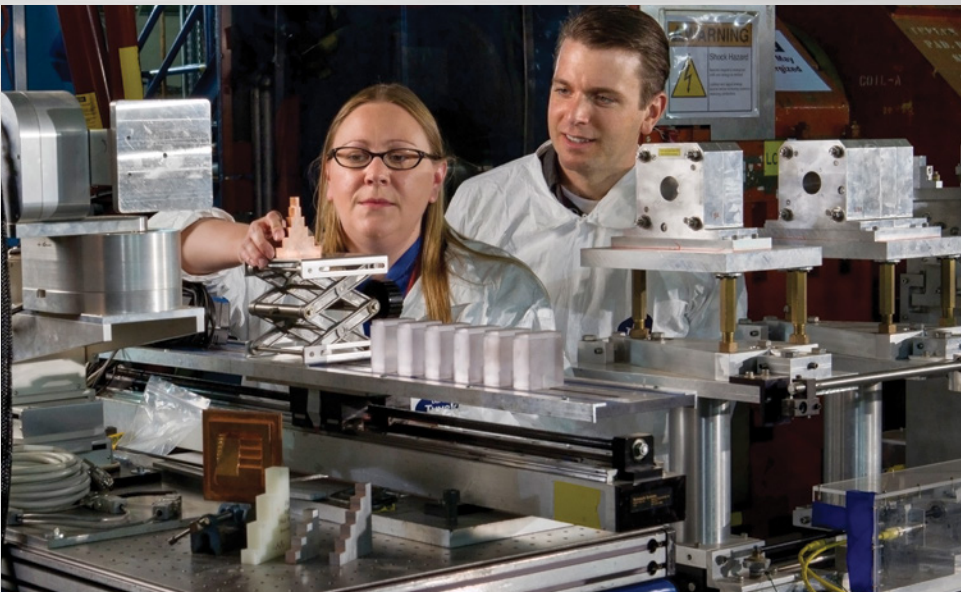
Steve Coryell already had an undergraduate degree in materials science from University of Michigan, but he wanted a graduate degree that gave him a sharper focus on metallurgy. “Mines is one of the very few schools left in the nation that has a program intensely focused on metallurgy,” he says. He also liked the idea of working on industry-sponsored research, rather than government-sponsored research, which can sometimes be more theoretical. “At the center, you have an opportunity to work on research that solves real industrial problems of today—on technology that you may actually see on the road or in the air,” and in the not-too-distant future.

Today, Steve Coryell works for West Virginia-based Precision Castparts Corporation (the same company that sponsored his graduate research project at ASPPRC) developing special nickel, cobalt, and titanium alloys that pick up where steel leaves off



Thomas Cooper

Blake Whitley inspects a test specimen used for multipass torsion simulation at the Gleeble thermomechanical simulator.



Courtesy of Amy Clarke

Amy Clarke of Los Alamos National Laboratory (LANL) and Seth Imhoff of Materials Technology-Metallurgy align a copper density calibration object for a proton radiography experiment. Proton radiography was invented at LANL and is used to image the properties and behavior of materials under extreme conditions and during processing.


in the energy and aerospace fields. “There is plenty of research being done to try to push the upper boundaries, in terms of pressure and temperature, of what steel can do, but there comes a point where you just cannot get away with using steel. That’s where we come in,” he says. For instance, the high pressure, high temperature, high-sulfur environment in an oil well several miles beneath the ocean floor might require alternative alloys less vulnerable to corrosion. So might geothermal piping, which is exposed to high salinity, or a commercial jet engine turbine, which is subjected to scorching temperatures with crushing pressure.

Steve Coryell says he uses the microstructure database and computational models he developed for his Mines thesis years ago, almost daily at his work today. He’s now paying it forward, serving as a sponsor representative to the steel center and regularly hiring interns and staffers from the ASPPRC. “It is an absolutely excellent graduate program. We are very actively hiring out of Mines,” he says.

Kaitlyn McNaughton ’06, metallurgical laboratory manager

for Blount International, says her company had a very practical reason for joining the center. “We simply don’t have all the specialized equipment we need to do all of the research we are interested in doing,” she says. “This gives us access to that equipment and the people with the skills to use it, and being part of the consortium opens us up to a whole pool of diverse research.”

McNaughton, who worked with the center as an undergraduate, reached out this year with the offer of sponsorship and the hope that Mines students could someday help Blount develop industrial chainsaw blades that last longer and cut through iron, concrete, and wood more efficiently. The deal was sealed on July 1, and one month later a graduate student was assigned to work with her on the project.

“That’s really pretty incredible,” says McNaughton. “A lot of universities are much more interested in the research aspect than the end goal, and it can take too much time to get things done. Mines is unique in that aspect. They are working on things that are relevant right now to people and to industry. After 30 years, they’ve got this down.” 

LOOKING BACK



This historic image shows a view looking south on Washington Avenue in downtown Golden. Note the "SWIM" sign in the left-center of the photo.

Swimming in History

The next time you visit the Buffalo Rose (formerly known as Shotgun Annie's and Duds), the pub in downtown Golden located near the Mines campus, be sure to belly up to the bar and take a little time to drink up some of its history. Turns out, the Rose is a true watering hole in more than one way. Yes, it's a bar with drinks, but it also has a swimming pool (no, this writer hasn't been drinking). Yep, a pool right under the dance floor. And yes, there's a Mines tie-in.

First, it's important to know that when you enter the building, you're going back to 1859 and you're standing in the second oldest

business establishment in Colorado (the first is R&R Supermarket in San Luis, which opened in 1857). The original building—a log structure straight out of the Old West—was replaced in 1902. Since then, it's had many lives: a saloon, a church, a dance hall, a hotel, a meeting place for politicians, and now a restaurant-bar.

Back in 1926, the building was converted from a car dealership to an indoor swimming pool and dubbed the Golden Plunge. It served as Golden's community pool and attracted swimmers from around the region, some of whom even came from Denver to cool off. According to Rick Gardner, a Golden-based historian, it's likely



Laurie Schmidt



Laurie Schmidt

This image shows the former location of the Golden Plunge swimming pool. The cement floor was the bottom of the pool.

The Buffalo Rose Bar & Grill in downtown Golden, Colorado.

that Mines students, faculty, and staffers took a dip as well, even though the school had its own pool on campus. But in 1929 when the Great Depression hit, the Plunge dried up—figuratively and literally—and closed.

Fast forward to 1938, when Mines was in the market for a new men's basketball coach. School officials found a strong candidate in Elwood Romney, a first cousin of former presidential candidate Mitt Romney's father. Gardner says Mines hired Elwood Romney partly because of his impressive basketball career at Brigham Young University, where he amassed 1,150 points. He was also an All-American and a member of the school's Hall of Fame, and he later played semi-professionally. "I'm sure in his basketball career, Romney certainly gave Mines teams some punishment," Gardner says.

When Romney arrived at Mines he learned about the shuttered Golden Plunge. Eager to bring history back to life, he led a community effort to resurrect the pool, and on July 4, 1938, the Plunge reopened. Romney apparently had a flare for promotion, because he strategically hired a Mines student who had the public relations chops to generate some buzz about the pool—Nils Christiansen.

At the time, there was no question that Christiansen would be able to spawn serious buzz; he was an Olympic swimmer. Christiansen had competed in the 1936 Olympics for the Philippines (he was the son of American-born missionaries there) in the 100-meter backstroke and in the 4 x 200-meter freestyle relay. Romney proudly advertised that Plunge patrons could learn from an Olympian. (It's believed that Christiansen also sometimes trained at the pool to compete for the United States at the 1940 Olympics, but those games were cancelled—pre-empted by World War II.)

Gardner says that to date, Christiansen is the only Mines or Golden athlete to have qualified to compete in two Olympic

games, much less for two countries. What's more, he's one of only three Olympic athletes from Mines. Jack Liddle competed as a runner in the 1936 games, and Leroy Brown earned a silver medal in the high jump in 1924. Gardner says former Mines athletic director Dave Johnston, who was also a mayor of Golden and state senator, traveled to Paris, France, to witness Brown's medal-winning jump.

Christiansen continued to work with Romney at the Plunge until 1941, when Romney opted to sell the pool to buy Denver's minor league baseball team, the Denver Bears. The pool was floored over when the building was transformed to a labor union hall in 1941. It has remained buried under flooring since then, housing only the hollow echoes of shuffling feet above.

But the story of the pool doesn't end with that burial. The current owner of the Buffalo Rose, Kenny Lee, happens to appreciate the building's rich history and is well aware of the pool. In fact, he says he's considering ways to incorporate the pool into an upcoming renovation—by lowering the dance floor into the pool for a sunken effect. "I know the building has a wonderful history, and I want to honor that history the best way I can," Lee says. "I'm looking for photos of the pool so I can maybe capture the look better, but I haven't had much luck with that."

Lee has also been angling toward bringing back the historic facades of the building and has consulted Gardner to get an accurate picture of what it looked like. Lee also plans to make the restaurant more of just that—a restaurant versus a bar. "It hasn't been renovated in 50 years, and it's developed more of a reputation as a biker bar," he said. "I want to redo the whole thing and modernize it and make it more family-friendly, but at the same time keep the 1859 look and feel. I want to make it more functional in today's society."

—Doug McPherson

SEND-OFF PARTIES

Mines Alumni Welcome Newest Orediggers

Transitioning from high school to college isn't easy, especially for students who move to new cities and states. Alumni from across the country do their best to help our newest Orediggers make the transition through annual summer "send-off" events in their hometowns.

In July and August, alumni volunteers hosted 18 send-off parties for new students, current students, students' families, and fellow alumni. These events afford the newest Orediggers an opportunity to calm their nerves, meet other students from their hometown, and get even more excited about attending our premier university. Events included a wild game cookout at the Munyan Family Hunting Conservation Museum in Phoenix, a Georgia hickory-smoked pork potluck in Atlanta, a tour led by alumnus Ken Brettmann '84 from the Army Corps of Engineers at the Ballard Locks in Seattle, and a Nationals vs. Rockies baseball game in Washington, D.C.

In Dallas, Orediggers not only attended a professional soccer game, but they also got to meet former Mines student Tesho Akindele (2014 Major League Soccer Rookie of the Year) of the FC Dallas soccer team. Akindele was drafted from Mines to play for Dallas, and send-off party attendees cheered him on and enjoyed a private meet-and-greet with him after the game. "It was great to see all of the incoming freshmen forging new connections and new friends before they even step foot on campus," said Tim Saenger '95, volunteer section coordinator and CSMAA Board of Directors member. Saenger added that meeting Akindele and seeing how dedicated he is to finishing his Mines degree was the icing on the cake.

Nate Brown '07 volunteered to



The send-off party in Phoenix, Arizona, included a wild game cookout at the Munyan Family Hunting Conservation Museum.

coordinate the Houston send-off party, because he believes that it's his way of giving back to new students. "It's very powerful to be able to come into a [new] situation and to be able to recognize someone you've met before. It makes introductions to other people easier," he said. "Life is all about relationships with other people, whether they're personal or professional. Providing the opportunity for someone to develop them ahead of time is very satisfying and rewarding."

Here in Colorado, 40 Orediggers gathered in Grand Junction for a potluck at the Lincoln Park Pavilion. Their annual send-off party is hosted by alumnus and section coordinator John Howe '83, the proud father of a Mines graduate and an incoming freshman.

"With four high schools in the valley and invitations going out to students from five or six counties, we get to meet a lot of students and families," Howe said. In Golden, instead of sending students off to Mines, the alumni association hosted a "welcome party" on August 3 at Coolbaugh House. More than 100 alumni, students, and families mingled over nachos and lemonade. New Mines president Paul Johnson joined in the festivities to welcome new students and share the feeling of being a campus newcomer.

The alumni association welcomes the newest Orediggers to the family, and we thank our volunteer alumni section coordinators for planning their local events.

—Emily Gonzales '08

ENERGY PARTNERSHIP

Saudi Aramco Explores Collaboration with Mines



Saudi Arabian Mines alumni gather to celebrate memories of Mines and its impact on their careers.

Around the globe, Mines is increasingly recognized as a source for creative and innovative solutions to Earth's most difficult energy challenges. In May, a delegation from Mines traveled to the Kingdom of Saudi Arabia for a visit that could mark the beginning of the most far-reaching energy partnership in Mines history. Ramona Graves, petroleum engineering professor and dean of the College of Earth Resource Sciences & Engineering; Tony Dean, senior vice president for Research and Technology Transfer; Hazim Abass, Petroleum Engineering professor and research director in the Petroleum Engineering Department; and Brian Winkelbauer, Colorado School of Mines Foundation president and chief operating officer, embarked on a week-long outreach tour that started in Jeddah and ended in Dhahran.

The Saudi Aramco management warmly welcomed the Mines delegation, ready to discuss how Mines, in partnership with Aramco, could collaborate with the company to provide better energy solutions for tomorrow. The trip culminated in discussions about a future energy center at the campus, to be sponsored by Saudi Aramco—one of the world's largest and most successful petroleum companies and the center of Saudi Arabia's economy. For Saudi Aramco, partnering with Mines is the next step in a long history of student exchange, research collaboration, and active alumni within the corporation. Of the 31 countries represented at Mines, the Kingdom of Saudi Arabia has the second highest number of students, with 42 pursuing undergraduate degrees and 27 pursuing graduate degrees. Of those, 41 students are sponsored by Saudi Aramco. Additionally, more than 80 Mines alumni reside in the Kingdom of Saudi Arabia, and 65 Mines alumni are currently employed by Saudi Aramco.

The visit included touring the Saudi Aramco Upstream and Downstream R&D Centers, as well as academic discussions with the two most prominent universities in the region, King Abdullah University for Science and Technology (KAUST) and King Fahd University of Petroleum and Minerals (KFUPM). The delegation toured the extensive facilities at Saudi Aramco, including drilling simulation rooms and other hands-on learning laboratories. Discussions centered on research and development and were facilitated by Saudi Aramco's chief technology officer, Ahmad Al Khowaiter. Engineers and scientists were presented with an overview of Mines' research expertise and strategic partnerships with federal agencies, such as the National Oceanic and Atmospheric Administration (NOAA), National Renewable Energy Laboratory (NREL), and the National Institute of Standards and Technology (NIST).

Ending the trip on a high note, more than 100 Saudi Aramco employees, most of whom were Mines alumni, celebrated Mines at a reception hosted by Khaled Al-Buraik, a vice president at Saudi Aramco. Continuing discussions between Mines and Saudi Aramco will allow them to explore a partnership and collaboration to help students attain a global perspective, bring new ideas to the Kingdom's largest company, and offer the world more energy opportunities.

—Rachelle Trujillo



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ON OUR WALL
Where is the most unique place that you've run into other Mines alumni?



On a scuba diving excursion in Cozumel, Mexico—there were four people on the boat, and three of us were from Mines.

-Cindy Marshall '98

I was working in a refinery in Chile, and a fellow Oredigger happened to be visiting the same town working as a subject matter expert.

-Chuck Lee '09

While touring the Boeing plant in Everett, Washington, my husband and I noticed a young lady wearing a Mines sweatshirt. Turns out, she had just graduated in petroleum engineering and had even taken a class from the godmother of our children.

-Roxann Mackenzie Hayes '95

Three of us had a mini-reunion weekend in Southern California, and we were hiking in Joshua Tree National Park when we saw a car parked next to ours with a Mines sticker. A few minutes later three guys showed up—all Mines alumni and also having a mini reunion trip.

-Lindsey Quinlisk '07

My husband and I, both Mines graduates, met a fellow alum hiking up Castle Peak near Aspen. Great to meet him, especially since he provided a beer and a ride miles back to our car.

-Arianne Dean '09, MSc '11

I was exiting the Anchorage airport and ran into a fellow Mines graduate who was picking up her husband, who was also a Mines alum.

-Brianna Atherton '01

I met a Mines alum on my street in Webster, Texas. Thank God we met, because three months later they had to be evacuated to my home (with their new baby) as the eye of Hurricane Carla passed over. They had lost most of their roof.

-Richard Paul Wilson Jr. '76

My husband and I (both Mines grads) ran into another Oredigger in the middle of Bourbon Street during Mardi Gras in 2010. Pretty much the last place I thought that would happen.

-Sarah Hodgson '09

When I was new to Tucson, I went to the Pi Beta Phi Tucson Alumnae Club events and met the treasurer who was a Mines grad. I ended up giving some help and advice to her daughter on her water treatment project.

-Margo Game '11

In Nashville at the Grand Ole Opry in the Ryman Auditorium.

-Renée Rainguet '08, MSc '09

A fellow Mines alum and I were walking through the market in Bangkok, Thailand, when we saw two guys wearing Mines shirts. Turned out they'd graduated the year before us. We all met up later that week to celebrate E-Days 'Round the World together.

-Sarah McDonald '07

In 2008 I met a civil engineering grad at a subway station in Santiago, Chile. We were both wearing Mines shirts.

-Tumen Badarch '07

I was one of two English-speaking people on a Russian flight to Samotlor Field, and the other one happened to be an Oredigger.

-Holly Willman '01

The first time I met my husband's family, I found out his aunt was an Oredigger—all the way out in Ohio. That sealed the deal!

-Sarah Hutson '07

While studying abroad in England, I took a trip to Italy. I was standing in line to see the David statue in Florence; I started talking to those around me and turns out the guy behind me was a Mines alum.

-John Harvey '05

In 2012 while in Vina del Mar, Chile, I took a photo of waves and posted it on Facebook. Another Mines alum saw the photo and as it turns out, he was staying at a hotel less than one mile from where I was. Later we connected for dinner and reminiscing.

-Scott O'Connor '07

My friends and I were visiting from Australia to hike the Continental Divide Trail, and we took a break on Berthoud Pass. A driver who stopped at the rest area was wearing a Mines shirt, so we introduced ourselves.

-Jim Happ '80



Join the conversation! Like us at facebook.com/minesalumni and join our CSMAA group on LinkedIn.

RACING ACROSS ALASKA



Video Sata

On March 21, 2015, Mines alumnus Alan Stevens '12 (Environmental Engineering) completed the 2015 Iditarod trail sled dog race in Alaska. The Iditarod, commonly called the *Last Great Race on Earth*, is a grueling 1,000-mile journey across frozen Alaska from Anchorage to Nome. Stevens trained a young team of Alaskan Huskies and crossed the finish

line in 12 days, 8 hours, 43 minutes, and 2 seconds. He credited his engineering background for his ability to problem-solve in stressful environments. "Competing in the 2015 Iditarod was the most challenging event of my life," he said. "It pushed me beyond any limits I had previously known and forced me to face extreme adversity head on. I will always be grateful for the perseverance and commitment of my canine companions. The memories of those 12 days will stay with me forever."



Paula Stevens



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ALUMNI NEWS



EDITOR'S NOTE

Are you looking for Class Notes? To fulfill readers' requests to increase magazine space for feature articles and other Mines stories, Class Notes are now listed exclusively online. Visit minesalumni.com/minesmagazine to see your classmates' latest accomplishments, employment changes, photos, and other updates.

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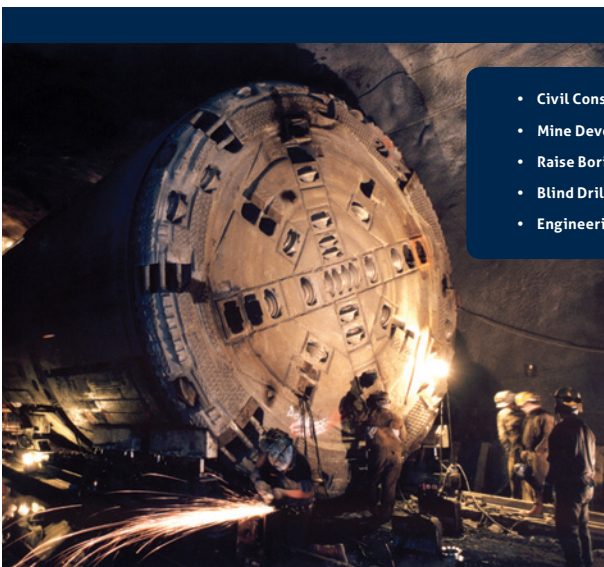
TAKING LOVE TO NEW HEIGHTS

Devin O'Brien '12 and Daniel Hazelwood eloped in Las Vegas, Nev., and were married aboard a helicopter on May 9, 2014. They wore matching orange sneakers. Devin is a production enhancement engineer and met Daniel, an electronics technician, while working at Halliburton.



Kathleen Morton

NEVER TOO LATE FOR THE M CLIMB The annual "M Climb" is a rite of passage at Mines and a 117-year tradition. Incoming freshmen trek up Mount Zion to add a 10-pound white rock to the famous "M" on the side of the hill. The 2015 freshmen class, which numbered nearly 1,300, hauled their rocks to the top, dipped them in white paint, and added their mark to the "M" that's visible for miles around. But this year, the new Orediggers had some company: two alumni from the class of 1965. "This was on my bucket list," said Ed May '65 (lower right in photo). "I never did it 55 years ago, and I thought I better get it done now." He was joined by his friend Lothar Klingmuller '65 (left in photo). "I did this 55 years ago, but there were just a few people," said Klingmuller. "And there were no girls." (See also Web Extras on page 3)



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24

Scholarship dollars awarded to
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Mechanical Engineering
Houston

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\$85,700

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OREDIGGERS REUNITE FOR A WEDDING Dana Morgan '10 and Tony (T.J.) Hanneman Jr. '10 were married at the Red Rocks Chapel in Morrison, Colo., on August 8, 2014. A reception was held at Hudson Gardens in Littleton, Colo. Dana and T.J. met on their first day of classes at Mines as freshman and became good friends, but they didn't start dating until after graduation. More than 20 Mines alumni attended the wedding.



AN ALUMNI ASSOCIATION ADDITION Zander Bruzgo was born in spring 2015 to Darek Bruzgo '95, former member of the Mines Alumni Association's Board of Directors, and Serena Bruzgo, former interim director of the Mines Alumni Association. Zander joins his very proud older sister.

THREE BAUMAN BOYS

Lyle Bauman and Tara (Schwein) Bauman '10 welcomed their third son, Kolbe Otto, on May 18, 2015. His older brothers, Thomas and Dominic, adore him and eagerly anticipate the day he can play with them.



YOUNG ENGINEERING AWARDS Islin Munisteri '09, a graduate of the Department of Petroleum Engineering, was awarded the New Faces of Engineering Award from Discover-E in 2014. The award acknowledges the talents demonstrated by young engineering leaders on projects that impact public welfare or further professional growth. The Society of Women Engineers' Houston-area section also awarded Munisteri the Young Engineer Award

in 2014, which recognizes young engineering professionals for their contributions to the economy, the community, and the public's understanding of engineering.

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Go Orediggers!



HIGH SCHOOL SWEETHEARTS Jeska Jurasic '12 and Mark J. Robinson '12 were married on September 22, 2014, at Sprague Lake in Rocky Mountain National Park. Eleven guests were in attendance, including Lydia (Gerber) Hebbert '11. Jeska and Mark met in high school when they were 15 years old and became best friends. After dating on and off for several years, they reunited during the summer after they graduated from Mines in 2012.



ALPHA DELTA REUNION In July 2014, alumni members of the Alpha Delta sorority reunited in Golden. The group took a tour of the new Student Center and enjoyed a luncheon at the home of one of the members. Pictured from left to right: Laura (Sorrentino) Klein '81, Betsy (Alstad) Lockhart '83, Pat Koestner, Ramona (Nicks) Heikel '79, Nancy (Ramirez) Escalante '80, Sharon (Carey) Hart '80, Mary (Cox) Wheeler '80, Shirley (Penick) Smuda '90, MS '92, Nanette Ann Avril '80, and Rose (Sahinen) Wheeler '80. Also at the reunion (not pictured) were Mary Bloomstran '79, Laura (Sandlin) Forbes, Deniece (Espeland) Korzekwa '80, and Rhonda Paxson '79.

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Matthew Ellsworth
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Doug Swartz
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B.S., Mining Engineering, Minor in Metallurgical Engineering, 1982



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FINDING LOVE IN GEOPHYSICS Karyn Stanley '14, MS '15 and Thomas Blitz '13 were married on June 13, 2015, at the Golden Hotel in Golden, Colo. Mines alumni in the wedding party were Nicola Hetrick '13 (maid of honor), Samuel Grossman '15 (best man), Elizabeth Pettinger '14 (bridesmaid), and Alissa Grossman '15 (bridesmaid). They met in Houston, Texas, at a Society of Exploration Geophysics conference and became engaged on the Mines campus.



A TEXAS WEDDING After a Christmas morning proposal, Liz Jeffries '08, MS '09 and Lance Abbott were married on September 20, 2014, at the country club in Midland, Texas. Alumni in attendance were René Rainguet '08, MS '09, Jessie Grainger '10, and Joe Barnholt '08. The couple met in West Texas while working for ExxonMobil.



YOUNG PLANETARY GEOLOGIST Sarah (Roberts) Teschner '09 and Ben Teschner '08, MS '11 welcomed their first child, Alan, into the world in April 2015. Alan is already a fledgling planetary geologist, staring at the solar system mobile above his crib.

IT'S A BOY Christina (Rollins) Curato '07 and Nick Curato welcomed their new son, Paul Richard Curato, on February 15, 2015.



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RESIDENCE LIFE CONNECTION Sheila Gardella '12 and Darren Doherty '11 were married on September 20, 2014, at St. Joseph's Catholic Parish in Golden, Colo. Darren and Sheila met while they both were working as Residence Life staff; Darren was the hall director for Randall Hall, and Sheila was a resident assistant for Weaver West. Many alumni were present at the wedding.

SMILES ALL AROUND Victoria

Jean Fitzsimons was born to Sean Fitzsimons '11 and Cindy (Allshouse) Fitzsimons '11 on March 24, 2014. Victoria has been growing fast and showing her Mines smarts over the past year, brightening everyone's day with her glowing smile. The family currently lives in Thornton, Colo.



SWING DANCING AWAY WITH HER HEART

Marybeth Riskey '12 and John Maloney '12 were married on June 13, 2015, at the Victorian Event Center at Heritage Square in Golden, Colo. Marybeth and John first met swing dancing at the Mercury Café and later discovered they had a class together. After graduating from Mines, they began dating. In photo from left to right are: Kathleen Riskey (bride's sister-in-law), Mahilet Hailemichael '13, Heidi (Lewis) Anderson '11, Karissa Riskey (flower girl and bride's niece), Kory Riskey '11, MS '13 (maid of honor and the bride's sister), Marybeth (Riskey) Maloney '12, John Maloney '12, Kailey Riskey (flower girl and bride's niece), Justin Cribbs '13 (best man), Matt T. Anderson '11, Eddy Cervantes '13, and Kenneth Riskey (bride's brother). Other Mines graduates in attendance were Justin Tappan '11, Alex Reznik '13, Chris Searcy '13, Andrew Brewer '08, MS '11, Daniel Broas '15, Tyler Coryell '12, and Mellisa Wu '10, MS '11.

ALUMNUS PROFILE

Signs of Life: Tim Lyons '80 is PI for NASA's Alternative Earths Team

So far, we only know of one planet in the universe that can support life. True or false?

From Tim Lyons' point of view, that's both true and false. "It's true we have an N of 1—that is, one known place where life exists," says Lyons '80, who earned his bachelor's degree in geological engineering at Mines. "But the Earth has a 4.3-billion-year history of liquid water, which is a precondition for life. Throughout that time oceans were forming, continents were emerging, temperatures were rising and falling, and the composition of the atmosphere and oceans was constantly changing."

We can think of these varying conditions from the planet's past as "alternative Earths," Lyons says. Most of these worlds bear no resemblance to the Earth we inhabit today—yet they've all supported life.

By understanding the long history of alternative Earths, says Lyons, we can increase the number of known, life-supporting worlds—and commensurately broaden the parameters of our search for habitable planets elsewhere in the universe.

As the principal investigator for the Alternative Earths Team of NASA's Astrobiology Institute, Lyons is helping to define those parameters. A distinguished professor of biogeochemistry at the University of California, Riverside, Lyons and his team are charting the complex interplay between biological evolution and planetary evolution over billions of years of Earth history.

"NASA realized it needed to refine its ability to assess whether chemical signals from an exoplanet's atmosphere [i.e., a planet outside Earth's solar system] might signify life," Lyons says. "The signals of life on Earth over time provide our best guide to recognizing signs of life somewhere else. We're studying the chemical signatures of biological processes and the way they are captured in the geological record."

Something as basic as the relative levels of carbon's two stable isotopes, Carbon-12 and Carbon-13, can provide telltale evidence of life, says Lyons. "When you look at ancient material and you see a slightly elevated level of Carbon-12, you can be reasonably sure photosynthesis was taking place," he says. That's because photosynthesizing organisms favor Carbon-12 over Carbon-13 and leave a record of that preference in their organic remains.

Lyons likes to imagine what an alien astronomer viewing the Earth two or three billion years ago would see as evidence for a



planet teeming with life, and much of that information would lie in the composition of our early atmosphere. Although there wasn't much oxygen in Earth's atmosphere or oceans, there was some, and other gases, such as methane, were keeping us warm in the face of a sun that was significantly weaker than it is today. These are the conditions that set the stage for the proliferation of large, complex cells—eukaryotes—necessary for multicellular life.

"Life is constantly responding to environmental change," Lyons says, "but it is also driving it. The cause-and-effect relationship runs both ways. One of the major parts of this interplay was the rise of oxygen." As oxygen-producing bacteria and algae became numerous in the oceans—and later plants covered the land—the oxygen they generated as a by-product of photosynthesis drastically altered the composition of the Earth's atmosphere and oceans.

"The world was craving oxygen for about 80 to 90 percent of its history," he says. "The Black Sea, the site of my doctoral research, is one of the last examples of that. It only has oxygen in about the upper 100 meters or so. Below that there is almost no oxygen. That condition is rare today, but it was common for most of Earth history."

A native of New Jersey, Lyons became fascinated with geology at an early age. He came to Mines for its combination of academic rigor and proximity to interesting earth formations. "Where else could you go to places like Red Rocks or the I-70 road cut for a three-hour lab?" he says.

Lyons played on the Mines soccer team and was a member of Beta Theta Pi, which he calls a big part of his experience and a great academic fraternity. "I really enjoyed the breadth of sciences at Mines," he says. "I appreciated what that was doing for me—the level of physics, calculus, and chemistry." That wide scientific lens has proven to be a great advantage as he helms the NASA Alternative Earths Team.

"Because this is such an interdisciplinary science, my team has specialists from many different backgrounds—biologists, microbiologists, biogeochemists, chemical oceanographers. We're making most of our progress at the interfaces between disciplines," he says. "My Mines background really set me up to step across those boundaries. It continues to pay dividends after all these years."

—Larry Borowsky

IN MEMORIAM

“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



EDITOR'S NOTE

Remembrances in Mines magazine focus on an individual's connections to the school, as well as key events and accomplishments. We aim to keep a balance between these important points and obituary length in order to honor as many deceased alumni as possible. For this reason, we no longer include lists of survivors in obituaries published in Mines magazine. To submit an obituary for publication in the magazine, visit minesalumni.com/obituaries.



LOUIS E. AMICK '50 died Nov. 15, 2012. Born in 1924 in San Antonio, Texas, he graduated from the University of Colorado in 1946 with his bachelor's degree, triple majoring

in chemistry, mathematics, and zoology. In 1950, he earned his professional engineering degree in petroleum engineering at Mines. As a student at Mines, he was a member of the Sigma Phi Epsilon fraternity. Lou worked as a petroleum engineer and was a senior regulatory compliance coordinator in Texaco's Denver division office for 33 years. He also served on the Environmental Affairs Committee of the Rocky Mountain Oil and Gas Association. He often testified as an expert witness before several state oil and gas conservation commissions.



ALBERT "ABE" BARNHARD '80 of Woodbury, N.J., died May 13, 2015. Born in 1958, Abe received his bachelor's degree in mining engineering from Mines in 1980.

He worked in various mines throughout Colorado and the southwest U.S. From 1988 to 1994, he was vice president of engineering at the Mt. Carmel Public Utility Company in Mount Carmel, Ill. From 1999 to 2015, he served as president of Barnhard Mining Company, LLC, in Idaho Springs, Colo., where he worked toward his goal of reopening the old Chase Mine in Russell Gulch, Colo.



DOUGLAS F. BENTON '50 of Pueblo West, Colo., died July 14, 2011. Born in 1922, Doug enlisted in the U.S. Navy after high school and served honorably during World

War II. He graduated from Mines in 1950 with a professional geological engineer degree. While at Mines he was a member of the Tau Beta Pi Honor Society and later a member of the President's Council. He went on to enjoy a 42-year career in the petroleum exploration industry.



CARL LOUIS BLAZEL '54 died at home in Honolulu, Hawaii, on May 30, 2015. Carl was born in West Bend, Wis., in 1931. He graduated from Mines in 1954 with a profes-

sional geophysical engineer degree. Carl worked in computer science and was a systems analyst for Planning Research Corporation, a think tank, in the early 1960s. He then became director of data processing at Dillingham Corporation in the late 1960s through the 1970s. He then owned Information Management Services, an information technology consulting company, from the late 1970s until just before his death.



MARVIN L. BUEHLER '48 died July 5, 2011. He was born in 1924 in Denver, Colo. After graduating from Wheat Ridge High School, Marvin enrolled at Mines, but his studies

were interrupted by World War II. He joined the U.S. Navy in 1944 and served two years as an electronic technician. He then returned to Mines and graduated in 1948 with a professional metallurgical engineer degree. Marvin worked at various technical positions and by 1958 had settled in the San Francisco Bay Area working for Lockheed Aerospace. In the early 1970s, he started working with Hughes Aircraft Company and relocated to Orange, Calif. He also became a world expert on inductive heating and had several of his approaches patented. He received the Lifetime Achievement Award from the National Metallurgy Association for his contributions.



FRANKLIN D. COFFMAN JR. '61 died on Aug. 7, 2011, in Derwood, Md. He was born in 1939. As a student at Mines, he played football and was a member of the

Tau Beta Pi Honor Society. In 1961, he received a professional metallurgical engineer degree. After graduating from Mines, Franklin served in the U.S. Army from 1962 to 1967 in Germany and Vietnam. He was awarded the National Defense Service Medal, the Vietnam

Service Medal, the Vietnam Campaign Medal, and the Army Commendation Medal. He was a member of the Veterans of Foreign Wars. Franklin did graduate work at Carnegie Mellon University and earned a master's degree in business administration from Santa Clara University. He also served for over 35 years in the U.S. Department of Energy in the Nuclear Regulatory Commission.



WILLIAM K. CROLL JR. '57 died March 7, 2015, in Cherryfield, Maine. He was born in 1934 in Pueblo, Colo. After earning his professional metallurgical engineer degree in 1957, he

worked for Battelle Memorial Institute in Columbus, Ohio, RCA Semiconductor in Somerville, N.J., the National Bureau of Standards in Washington, D.C., and the Winter Harbor Navy Base in Winter Harbor, Maine. As a student at Mines, he was a member of the Kappa Kappa Psi Honor Society. In 1974, his family moved to Cherryfield, Maine, to do organic farming and help in a pottery business.



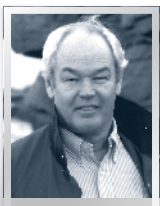
ROBERT T. FOREST '56 died on Jan. 14, 2015, in Sparks, Nev. Bob was born in 1929 in Montezuma County, Colo., and graduated from high school in Durango, Colo., in 1947.

A year later, he joined the U.S. Navy and served four years in San Diego, Calif. He then received his professional geological engineer degree from Mines in 1956. He then worked for the Chile Exploration Company at Chuquicamata, Chile; the Rico Argentine Mining Company in Rico, Colo.; and the Phillips Petroleum Company in Grants, NM, and Reno, Nev. Following his retirement from Phillips, Bob went on working as a full-time consultant for Coral Gold Corporation for several years at their Crescent Valley, Nevada gold operation. After Coral Gold, he was a consultant to OESI Power Corporation until 1994. In 1993, Bob received the Special Achievement Award from the Geothermal Resources Council. From 1994 to 1995, he was chief of regulation in the Division of Minerals for the state of Nevada.



FREDERICK A. "HEINIE" FOSS died May 21, 2015, in Golden, Colo. Heinie was born in 1917 and was raised in Golden. In 1935, he graduated from Golden High School. During World War II, he

was a pilot in the U.S. Army Air Corps. After his service, he was a pharmacist and managed Foss Drug, then a small drug store which was founded in 1913 by his parents, Henry and Dorothy Allen Foss. He expanded the store to the Foss General Store and Drug, which included three floors and over 40,000-square-feet that served Golden for 94 years. As a youth, he spent a lot of time on the Mines campus and was allowed to audit math and chemistry classes. In 1987, he received the Mines Medal from Colorado School of Mines. He enjoyed attending athletic competitions at Mines, and in 1996, he was inducted into the first Mines Athletic Hall of Fame as Outstanding Supporter. He was a member of the Mines Athletic Hall of Fame and the President's Council, and he was made an honorary colonel in the ROTC and an honorary member of the Mines Alumni Association. Heinie became known as "Mr. Golden" for his civic service. He helped found the Golden Civic Foundation and served as its first president. He served on the Chamber of Commerce for 14 years, including a term as president. He was a member of the Golden City Council, a past president of the Golden Kiwanis Club, and a 50-year member of the Golden Masonic Lodge.



CLYDE "JACK" FROST '60 died March 7, 2013, in East Dorset, Vt. Born in 1933 in Danbury, Conn., Jack earned his professional engineer of mines degree from Mines in 1960. As a student he was

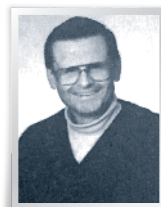
a member of the Beta Theta Pi fraternity. He worked for Colorado Fuel and Iron, U.S. Gypsum, and Ingersoll-Rand.

After graduation, he was a member of the President's Council and was an alumni admissions representative. He served in the U.S. Navy as an aviation electronics technician on the aircraft carrier *Midway* during the Korean War. Jack helped form Stavens and Frost in 1965, which is now Frost Wells and Pumps.



JOHN J. GALLAGHER '55 died May 12, 2015, in Dartmouth, Nova Scotia, Canada. John was born in 1932 in Black Diamond, Alberta, Canada. John was

awarded a full scholarship to Mines, and in 1955, he received his professional engineering degree. As a student, he was a member of the Kappa Sigma fraternity and the Tau Beta Pi Honor Society. From 1955 to 1965, he worked for Esso in Bogata, Colombia, and for CDN Superior in Alberta, Canada. From 1965 to 1985, he worked in the Great Alberta Oil Patch. In the United States, he worked on wells in Indiana, New York, and New Jersey. In 1971, he received a bachelor's degree in geography from the University of Calgary. From 1985 to 2000, he worked with ReMax in Calgary. In 2011, John and his wife, Judi, left Calgary and moved to Halifax, Nova Scotia, to be near family.



ROBERT C. HARTMANN '58 died May 7, 2015, in Kerrville, Texas. He was born in 1936. In 1958, he earned his professional geological engineer degree at Mines. As a student, he was a member

of the Kappa Sigma fraternity, Blue Key, Sigma Gamma Epsilon, Tau Beta Pi, and Scabbard & Blade. After graduating from Mines, he was a member of the Colorado School of Mines Alumni Association and President's Council. Robert served in the U.S. Army as a deep sea diver stationed in San Francisco, Calif. During his career, he worked as vice president of Canada Operations for Pennzoil and Pennzoil Petroleum; division production manager for Pennzoil International; division production and drilling superintendent for Pennzoil International in Houston, Texas; operations manager for Pluspetrol in Argentina and Alaska; and engineer for Shell Oil Company in California. He received a master's degree in petroleum engineering from the University of California-Berkeley.



THOMAS C. HEDLUND '44 died Feb. 4, 2015, in Grand Junction, Colo. He was born in 1921 in Chicago, Ill., and grew up in Hugo, Colo. In 1939, he graduated from high school in Hugo,

Colorado and then attended the University of Colorado for two years before transferring to Mines. As a Mines student, he was a member of Theta Tau Honor Society. In 1944, he received his professional engineer of mines degree from Mines. After graduating, he worked for the Telluride Mines before joining the Navy, where he learned radio radar and flew in a torpedo bomber out of San Diego, Calif. Through the 1950s and early 1960s, he worked in mines throughout Colorado, New Mexico, Nevada, Arizona, and California. From 1963 to 1971, he was general superintendent and resident at the Idarado Mine Company at Ouray and Telluride, Colo. In 1971, he was named president-elect for the Colorado Mining Association. In 1972, he became the owner of Telluride Transfer, a freight and passenger transportation business. After six years, he returned to mining and turned over the operation to his son Bob Hedlund '75. In 1977, Thomas began working at the Strawberry Mine for Teledyne Tungsten in Fresno, Calif., and then UNC Mining and Milling Services in Gallup, N.M. In 1981, he began working for Marquette Minerals in Denver, Colo., where he retired as chief engineer in 1984. He was a past chief of the Telluride Volunteer Fire Department and past president of the Telluride Rotary Club.



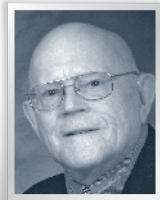
DAVID W. LEE '59 died Nov. 25, 2012, in Houston, Texas. He was born in 1936 in East Orange, N.J. In 1959, he received his professional geological engineer degree. After graduat-

ing from Mines, he was a commissioned officer in the Army Corps of Engineers. David had a distinguished career in the oil industry working for Texaco, GoldKing Production, and Panaco. He was a member of the American Association of Petroleum Geologists and the Society of Petroleum Evaluation Engineers.



RAYMOND C. LEE '87 died Apr. 20, 2014, in Laughlin, Nev. He was born in 1957 in Oak Ridge, Tenn. He was a graduate of the U.S. Naval Academy and served five years in the

U.S. Navy, attaining the rank of lieutenant. In 1987, he received a bachelor's degree in geological engineering from Mines. As a student, he was involved in the Multicultural Engineering Program. After graduating from Mines, he worked for the U.S. Department of Interior and served as a district manager for the Bureau of Land Management.



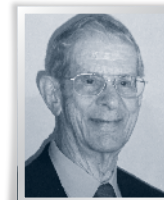
JOSEPH H. MILLER '50, MSc '51 died Nov. 20, 2014, in Houston, Texas. He was born in 1928 in Greeley, Colo. While at Mines, he was a member of the President's Council. In 1950, he

received his professional geological engineering degree from Mines, and in 1951, he earned his master's degree in geology from Mines. He then served in the U.S. Army Corps of Engineers in Korea as a company unit commander. After his military service, he completed his MBA at University of Denver. Joseph began his 36-year career as an oil scout with Carter Oil and retired as manager of analysis and support for Exxon Exploration. He served as company unit commander in the Army Corps of Engineers in Korea.



TAMARA J. MUHIC '82 of Windsor, Colo., died July 16, 2012. Born in 1960, she received her bachelor's degree in chemical and petroleum refining engineering from Mines, where she

attended as a Boettcher Scholar. As a student, she played volleyball and was a member of the Tau Beta Pi and Blue Key Honor Societies. She started her career working as a process engineer for ARCO Petroleum in Chicago. During her 30-year career she held various process and environmental engineering positions, working for Waste-Tech Services, Boise Cascade, Goodrich, North Star Engineering and Surveying, Inc., and Engineering Analytics, Inc., eventually making her way back to her home state of Colorado. One project dear to her heart was her work on the design of the Pueblo Animal Services Shelter. Tamara was the oldest of four sisters, all Mines alumnae: Teresa Muhic '85, Tawnya Chott '85, and Katheleen Thurston '88.



CHARLES D. TYLER '53 died Feb. 8, 2011, in Hurst, Texas. He was born in 1920. During World War II, he served in the Army Air Corps. As a student at Mines, he was a member of

the President's Council and Tau Beta Pi and the Sigma Gamma Epsilon Honor fraternities at Mines. In 1953, he earned his professional geological engineer degree. He also became a member of the American Association of Petroleum Geologists and the American Institute of Petroleum Geologists.

—Compiled and written by Doug McPherson, Danelle Herra, and Jo Marie Reeves

ALSO REMEMBERED

- TESFALUL G. ALAZAR '87 June 18, 2011
- HOMER J. BOYD '63, MS '69 March 20, 2011
- HOMER BREAUULT '57 June 20, 2014
- JOHN L. COOK '54 May 18, 2014
- MARTIN A. DAVIS '85 August 26, 2013
- DONALD L. ELLSWORTH '54 January 13, 2012
- ANDREW W. EXTRACT '76 March 15, 2014
- FRANK K. FURLAN '51 October 2, 2012
- BRADLY G. GILMORE '90 September 28, 2011
- KENNETH B. HUTCHINSON '39 March 7, 2011

- TOD J. LEFEVRE '88 March 7, 2011
- JOSEPH W. PERLMAN '40 April 2, 2011
- RONALD E. PLETCHER '65 September 13, 2011
- ALBERT J. QUINLIVAN JR. '49 January 1, 2011
- KEVIN L. RADEL '90 February 17, 2012
- STEVEN L. SCHUHART '72 September 14, 2013
- CHARLES R. SEAR '56 April 29, 2013
- THOMAS C. SPANGLER '61 July 21, 2011
- PAUL M. VEATCH '89 November 24, 2012
- C. WALLACE WADE '60 December 30, 2012

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Rob '68 and **Ann McKee** made gifts totaling \$144,620 in support of several programs, including the McKee Scholarship Fund.

Thomas C. '36 and **Mary Snedeker** made a gift of \$100,000 in support of the Petroleum Engineering Department.

Shell Oil Company gave a gift of \$100,500 to support several departments, programs, and student organizations.

Phillips 66 gave \$175,000 to support scholarships, departments, programs, and student organizations.

The Estate of Robert D. Griffey '39** made a gift of \$261,047 towards advancing the university.

Jerry '72 '75 and **Karen Zink** committed \$800,000 in support of numerous initiatives including the 2016 Fiscal Year Challenge and an Undergraduate Research Project in Civil and Environmental Engineering.

Bill and Karen Scoggins gave \$200,000 in support of the new Clear Creek Athletics Complex.

The Hugh and Michelle Harvey Family Foundation made gifts totaling \$265,000 benefiting the Geology and Geological Engineering Department as well as the Scoggins Board of Trustees Scholarship Fund.

J. Don Thorson '55 made a gift of \$104,097 to support the university with specifics to be determined.

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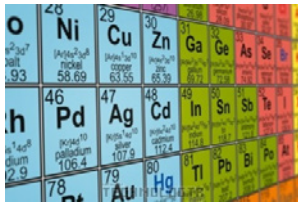
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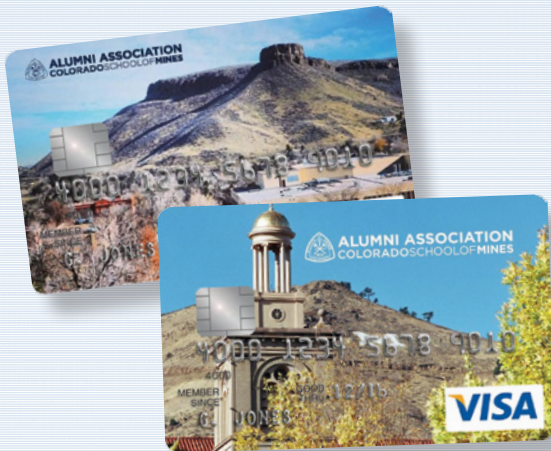


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MINER'S PIC



OREDIGGER ROLLIN' IN A FORD VAN

Many college students look forward to earning their degree, followed by the lucrative salary, followed by the big house. But Naomi Plasterer '14 has chosen a different path—one that allows her to live small and give to others in need.

Naomi, who earned her degree in mathematics and computer science, lives with her dog, Lopi, in a 2000 Ford E150 van, affectionately known as Gunther. Currently a software engineer in San Francisco, she decided to make the big downsize when she realized how little time she spent in her very expensive apartment. While she enjoys the freedom of being able to go anywhere on a moment's notice, Plasterer says the most gratifying part is having extra money to give to people in need. "It's pretty rewarding to just have less stuff," she says. "You really don't need much to live.

"Mines enabled me to get this great degree, which landed me an amazing job. And that has allowed me to make a substantial amount of money to give to the people who really need it."



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