

MINES MAGAZINE

COLORADO SCHOOL OF MINES MAGAZINE

Fall 2017 Volume 108 Number 4



HELLUVA ENGINEER

Mines alumni use creative thinking and strong problem-solving skills to launch startups and find success in the business world.

14

CATALYZING CHANGE

University Innovation Fellows are enhancing Mines' entrepreneurial mentality and improving the student experience with new ideas and innovative spaces.

20



COLORADO SCHOOL OF MINES
EARTH • ENERGY • ENVIRONMENT



Several groups, including the Mines Innovation Fellows and the Entrepreneurship and Innovation Alumni Interest Group, are part of a campus-wide initiative cultivating a culture of entrepreneurship and advancement for which Mines is known. The groups often work together, helping alumni and students fulfill similar goals.

Photo by Joe DeNero

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Cover image: Mines is emphasizing the entrepreneurial spirit and innovative ideas on campus and within the alumni community. Stuart Bennett '66 and Jim Thorson '85 are part of the Entrepreneurship and Innovation Alumni Interest Group, which works to provide better business connections for students and alumni and often collaborates with students, such as University Innovation Fellows Emma May and Sam Warfield, to fulfill this campus-wide initiative and create lasting change at Mines. (Photo by Joe DelNero)

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HELLUVA ENTREPRENEUR

14 Mines alumni are taking the business world by storm, one startup at a time.

CATALYZING CHANGE

20

Mines' Innovation Fellows are enhancing the entrepreneurial mindset on campus by creating spaces and programs to help improve the student experience and spur new ideas.

WEB EXTRAS | MULTIMEDIA

TO VIEW WEB EXTRAS, PLEASE VISIT MAGAZINE.MINES.EDU

BECOMING OREDIGGERS

At the start of another school year, Mines' class of 2021 participated in the annual M Climb, trekking up Mt. Zion to add their rocks to the M and coat the emblem in a fresh coat of whitewash. Check out our footage of the annual event, as well as coverage from *Denverite* and the *Denver Post*.

MINES INTERNET RADIO

Did you know Mines has its own radio station? CSMBC provides programming available to all students, faculty, staff, alumni and the Golden community, with a mission of exposing great new music and broadcasting Mines sports and live events. The club offers hands-on experiences for students as a source for artistic and cultural expression. Listen live online at radio.mines.edu.

GREAT AMERICAN SOLAR ECLIPSE

On Aug. 21, 2017, North America witnessed a historic celestial event, a total solar eclipse that arced across the sky. Over the course of three hours, Mines students, faculty, staff and alumni gathered on the intramural fields on campus to watch the moon pass between the sun and Earth, blocking the sun with 92.1 percent totality. Check out photos of the event and relive the excitement of the once-in-a-lifetime eclipse.

Correction: In the Orediggers Give Back piece on page 30 of the Summer 2017 issue, there was an incorrect photo placed for Al Ireson in elementary school. This photo has been updated online.

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TGS
Michael Van Horn MS '79

2016-2017 Scholarship Recipients

Ryan Buck

Sophomore, Undecided
Houston

Cody J. Huffmeister

Senior, Petroleum
Engineering, Houston

Alanna M. Winfield

Senior, Mechanical
Engineering, Houston

Jesse A. Baxter

Freshman, Undecided
College Station

Number of scholarships
granted to date: 35

Scholarship dollars
awarded to date:
\$143,521

Endowment funds raised
to date: \$575,000

33rd Annual Golden Golf Tournament

Lunch Sponsor

Fifth Creek Energy

Putting Contest Sponsor

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Hole-in-One Sponsor

Industrial Chemicals
Corp.

Hole Sponsors

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FirstBank
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Sodexo
Maxson Engineering

Hole Sponsors cont.

Shaffer Baucom Engineering
and Consulting
Tallgrass Energy
Trane
White Eagle Exploration, Inc.

2016-2017 Scholarship Recipients

Jill Remmers '17

Geophysical Engineering
Fort Collins

David Jimenez '17

Petroleum Engineering
Fort Lupton

Number of scholarships
granted to date: 2

Scholarship dollars
awarded to date: \$4,000

Endowment funds raised
to date: \$19,000

3rd Annual Dallas Alumni Golf Tournament

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Sooner Pipe and Supply

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Rene St. Pierre '76
MS Energy Services

Corporate Blue Sponsors

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RigUp
Patterson-UTI Drilling
Jeff Frayser '83
Will Culp '99
Tim Saenger '95

Hole Sponsors

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Ulterra

2016-2017 Scholarship Recipients

Logan Braden

Freshman, Mechanical
Engineering, Keller

Rachel E. Becker '17

Geological Engineering, Coppell

Number of scholarships
granted to date: 2

Scholarship dollars awarded
to date: \$2,000

Endowment funds raised
to date: \$32,600

8th Annual Endowed Scholarship Golf Tournament – Oklahoma

Platinum Sponsors

Aveda Transportation
and Energy
Cathedral Energy Services
T. Weston Hamilton '07
Montclair Energy Seventy
Seven Energy Alan Stracke
'82
Jim Taylor '76
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VES

Hole Sponsors

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Drilling
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Seventy Seven Energy
Smith Bits – a
Schlumberger Company
Ulterra
Varel Drill Bits

Navy & Silver Sponsor

Brett L. Lewis '07

2016-2017 Scholarship Recipient

Colin T. Morris

Sophomore
Mechanical Engineering
Oklahoma City

Number of scholarships
granted to date: 10

Scholarship dollars
awarded to date:
\$52,000

Endowment funds raised
to date: \$164,170+



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Comments and suggestions are welcome. Contact us via our contact form at minesmagazine.com/contact-us or via mail at Mines Magazine, 1500 Illinois St., Golden, CO 80401. To update your address, go to minesalumni.com/update or email CSMAA@mines.edu.

ALUMNI NOTE

Stuart Bennett '66 is leading the new entrepreneurship and innovation alumni interest group.

Photo by Ashley Spurgeon



BUILDING A CULTURE OF ENTREPRENEURSHIP & INNOVATION

In January 2015, I attended a visiting lecturer event at Mines, where writer and biographer Walter Isaacson presented a review and discussion of his recently published book, *The Innovators*. He discussed the history of people involved in development of computer technology and the evolution of tools and companies we have today, such as the internet, Microsoft, Apple and Google. In many cases, the founder of an idea or inventor of a new technology was not the person with the vision to apply the idea and benefit an institution or society overall. That process is entrepreneurship.

After listening to this presentation, I thought, "How can Mines be one of those cultural environments that encourages not only invention and innovation through research, but also entrepreneurship?" In fall 2016, Mines' President, Paul C. Johnson, challenged the Alumni Association Board of Directors to develop an interest group centered around entrepreneurship and innovation. This challenge piqued my interest, and I volunteered to be chair of a committee to lead the effort.

While the university is working on ways to facilitate entrepreneurship and innovation on campus, the E&I Interest Group Committee has developed roles for the alumni association to connect the campus with alumni to continue to develop and encourage an entrepreneurial and innovative culture across the entire Mines community. Today's graduates may not only have multiple employers during a career, but they probably will have multiple careers. The E&I interest group will create a "hub" within the alumni association that connects those seeking assistance in career change, expansion and business formation with graduates and outside available talent (patent attorneys, angel investors, business incubators and accelerators, business brokers, corporate strategy specialists, etc.) to spur the success of Mines alumni. We hope to create a culture that encourages a spirit of entrepreneurship and provides a pathway with experienced guidance that can increase the odds of success, regardless of their career path.

The E&I culture at Mines is alive, well and rapidly expanding in vitality. If you want to be a part of this exciting effort, either for your own career growth or to offer your specific expertise and experience in the E&I community, I invite you to jump aboard by contacting the alumni association and getting involved.

Stuart E. Bennett '66

Mines Alumni Association Director
E&I Interest Group Chair

PRESIDENT'S CORNER

SPARKING INNOVATIVE IDEAS AND BUILDING COMMUNITY

Once again, we have kicked off another year here, introducing a new batch of Orediggers to Mines and welcoming back familiar faces. With the beginning of the school year comes a great influx of excitement and many events on campus, all leading to new relationships and innovative ideas from the Mines community.

The freshmen this year got to experience Oredigger Camp in early August at Camp Como near Fairplay, Colo. Over 2 ½ days, freshmen experienced team-building, design challenges, reflective exercises and fun activities (including a spontaneous dance-off around the campfire I will never forget). The key feature of the camps was that they were led by upperclassmen, who mentored, offered advice and shared their love for Mines. The freshmen arrived a bit timid and unsure about college but left with new friends and with excitement for the start of their Mines experience. We hope to have alumni participation in next year's Oredigger Camps, so look for an invitation next spring through the office of alumni relations.

Along with new events, we make sure not to forget our long-standing traditions. On Aug. 18, 2017, we made our annual water- and fight song-filled trek up Mt. Zion for the M Climb. A number of alumni joined the freshmen, including Jim White, whose grandson is the fourth successive generation in their family to attend Mines. Late September brings together alumni and students for Homecoming, and we are looking forward to other signature events to come, including E-Days in the spring.



President Paul C. Johnson joined the class of 2021 for the annual M Climb on Aug. 18, 2017.

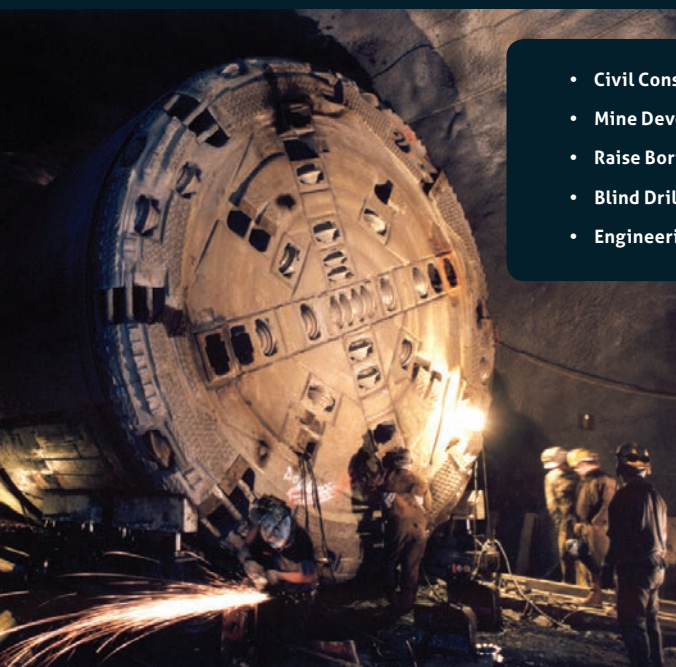
Photo by Joe DelNero

This year also sees the grand opening of our newest building on campus—the CoorsTek Center for Applied Science and Engineering. The building will be home to leading-edge interdisciplinary research and teaching and industrial partnerships, and we hope those will lead to breakthroughs in science and education that will have profound impacts on society.

All these events reflect the importance of community at Mines, and how we collectively embody the innovation and entrepreneurial spirit Mines is known for and takes pride in. Community and connections are important to the success of our students and our alumni, and the strength and uniqueness of our Mines community is part of what make us all proud to be Orediggers. Check out the signature events we have coming up and other ways you can connect with your fellow Orediggers by visiting calendar.mines.edu.

Go Orediggers!

Paul C. Johnson, PhD
President and Professor



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REIGNING BEST

MINES MATERIAL ADVANTAGE CHAPTER NAMED TOP IN THE WORLD

Mines Material Advantage Chapter was named the organization's Most Outstanding Chapter for 2016-2017 and was recognized on Oct. 9, at Materials Science and Technology 2017, a technical meeting and exhibition in Philadelphia.

The chapter also received the award in 2013-2014 and 2014-2015 and was named a Chapter of Excellence for 2015-2016. Chapters are judged by their programming, career development activities, service, social activities and chapter management.

"I believe that, more than anything, cooperation and communication among the members of the executive committee is what helped to set us apart," said Reid Winchester, the new chapter president. He cited students' success in the Materials Bowl and bladesmithing competitions organized by The Minerals, Metals & Materials Society (TMS) and the ceramic disc throw competition at MS&T.

The Material Advantage program provides undergraduate and graduate students in materials science and engineering programs with memberships to four organizations at a lower cost: The American Ceramic Society, Association for Iron &



The Mines Material Advantage Chapter was named the organization's Most Outstanding Chapter for 2016-2017.

Photo courtesy of the Mines Material Advantage Chapter

Steel Technology, ASM International and TMS. Winchester noted the interests of all four societies are well represented among the chapter's membership. "This is reflected in the engagement of a lot of students in CSMMAC activities," he said.

This semester, the chapter is putting together a YouTube committee to promote the different aspects of materials engineering, from micro- to macroscopic. The group also launched a chapter of Keramos, the professional fraternity for ceramic engineering. Keramos will manage the hot glass shop in Mines' Hill Hall foundry. "We are also working on collaborating with more clubs on campus to expand our presence beyond the MME department," Winchester said.

"It's a great honor to be recognized as the Most Outstanding Chapter," Winchester continued. "There are over 100 chapters worldwide, and we're proud to be the leader and represent Mines."

By **Mark Ramirez**



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WHAT'S YOUR NUMBER?

A BRIEF LOOK AT HOW THE CLASS OF 2021 COMPARES TO MINES ALUMNI AS A WHOLE



6% OF MINES ALUMNI LIVE INTERNATIONALLY

TOP 5 NON-U.S. COUNTRIES WHERE ALUMNI ARE BASED



#1 MALAYSIA



#2 CANADA



#3 SAUDI ARABIA



#4 INDONESIA



#5 THAILAND



46%

OF MINES ALUMNI LIVE IN COLORADO

TOP 3 U.S. STATES (EXCLUDING COLORADO) WHERE ALUMNI AND THE CLASS OF 2021 ARE FROM



#1 TEXAS



#2 CALIFORNIA



#3 WASHINGTON

29,589

CURRENT TOTAL
NUMBER OF
ALUMNI

1,363

NEW STUDENTS
ENROLLED IN
FALL 2017

4,612

TOTAL
UNDERGRADUATE
ENROLLMENT

4% OF THE CLASS OF 2021 IS INTERNATIONAL



55%

OF THE CLASS OF 2021
IS FROM COLORADO



31%

WOMEN MAKE UP 31%
OF THE CLASS OF 2021



136

INCOMING ATHLETES, INCLUDING
TRANSFER STUDENTS

TOP 5 NON-U.S. COUNTRIES WHERE THE CLASS OF 2021 IS FROM

1. MALAYSIA
2. SAUDI ARABIA
3. CHINA
4. MEXICO
5. OMAN



142 LEGACY STUDENTS

OREDIGGER CAMP

A NEW FIRST-YEAR TRADITION AT MINES

The start of your first year of college can be daunting—it's a new environment full of new experiences, new expectations, new people and, for most freshmen, even a new bed. But this year, a group of incoming students have a leg up over freshmen of years past, thanks to the inaugural Oredigger Camp.

A few weeks before the start of classes, more than 200 first-year students spent 2 ½ days up at Camp Como near Fairplay, Colo., having fun, making friends and getting introduced to being an Oredigger. The impact was clear well before the last group of students loaded onto the bus back to Golden.

"It made me less nervous about going to school in general," said Liz Luce, a freshman from Colorado Springs planning to study chemical and biological engineering.

"Getting to know people beforehand is great," added Maddie McKowen, a freshman from Houston looking to study environmental engineering—and play club lacrosse along with her new friend Luce. "At least you can have some bonds before you get there."

Arriving at Oredigger Camp shortly before lunchtime, students spent most of Day 1 tackling team-building activities—low ropes, tug-of-war and more. Day 2 started bright and early with self-reflection and goal setting. Later,



This year, Mines held Oredigger Camp, an opportunity for incoming freshmen to build new relationships and learn what it means to be an Oredigger.

Photo by Julian Liu

during free time, students soared through the mountain air on zip lines while others jumped in on pickup games of volleyball, 9 Square and Gaga Ball.

Engineering challenges got students thinking and working together. In one task, small groups built a basket out of plastic drinking straws and tape that could protect an egg when dropped from the top of a ladder. In another, larger groups were handed three rolls of duct tape and the challenge of taping someone to the wall. The group whose student stayed stuck the longest won.

Moving forward, Oredigger Camp has the potential to be something just as important to the Mines experience as the M Climb, said Dan Fox, vice president of student life. Fox said: "That's where I want Oredigger Camp to go, not just as a tradition but as something that makes a big difference and something they'll never forget."

By **Emilie Rusch**

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Patent Attorney,
Shareholder

B.S., Engineering, with honors, 2003; M.S., Engineering Technology Management, 2005 Top Graduating Electrical Engineer

Bruce Kugler
Patent Attorney,
Shareholder

B.S., Petroleum Engineering, 1981

Doug Swartz
Patent Attorney,
Shareholder

B.S., Mining Engineering, Minor in Metallurgical Engineering, 1982

Brad Knepper
Patent Attorney,
Shareholder

B.S., Electrical Engineering, 1998

Kristen Gruber
Patent Attorney,
Associate

B.S., Chemical and Petroleum Refining Engineering, 2000

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BRINGING THE ACADEMIC AND COMMERCIAL WORLDS TOGETHER

A Q&A WITH MINES' NEW DIRECTOR OF ENTREPRENEURSHIP AND INNOVATION

Earlier this year, Mines launched a new Center for Entrepreneurship and Innovation. The center focuses on connecting Mines with the business community and supporting the environment of invention and enterprise that has always been at the heart of Mines. *Mines Magazine* sat down with the center's director, Werner Kuhr, to ask him about his goals and the importance of entrepreneurship and innovation.

What are your goals as the director of this new center on campus?


The first goal is to spread this concept of entrepreneurial thinking, or teaching students how to demonstrate the value of the work they're doing. Most people, when they think of entrepreneurship, think of starting a company, and that's great and something I certainly want to encourage, but the same principles and process is also useful for starting a campus group, a nonprofit, a research program or even becoming a manager. They all require the same skillsets. It's important to know how to understand how to optimize a process in order to do it quickly and in a way people will understand.

The secondary goal is to actually start companies and commercial activities here at Mines. The technology is here, the people are here, the human capital is here, and having access to those resources and what I would call "entrepreneurs-in-residence"—Mines' alumni community—has a huge potential.

Why was this center created and why is it important to Mines?

From a global perspective, I think every university has to be involved in these efforts. Students, expect it, new faculty expect it, graduate students expect it, the community expects it. As the level of funding has gone down, there is going to be a need for new sources of funding for research. I think it's part of our society now.

I think students are also really looking for how they are going to use their knowledge and why it's important. I think the entrepreneurial component can bring that to them, because it'll demonstrate to a student why they learned thermodynamics or why calculus is important.



Werner Kuhr is the director of Mines' new Center for Entrepreneurship and Innovation, bringing academics and commercial opportunities together to help students and alumni take their ideas to the next level.

Photo by Ashley Spurgeon

What plans do you have for this center that can you share with us?

Everything is still in development, but I think there are some great synergies going on already on campus. We can offer an E&I track within certain programs to expose students to some of the core concepts and get those who are really interested to advance more quickly.

In addition, there are already a number of competitions on campus, such as the Newmont Innovation Challenge, that I think could be reformatted a bit. Right now, it's sort of a one-shot event, but I'd like to make it almost a full year process. We can provide workshops and training to help students formulate ideas and figure out how to present them, have the competition in January and then demonstrate the results of the winning teams at the end. This will help show the relevance of the innovative ideas and help build a community.

How do alumni fit into these efforts?

We can draw from our successful alumni community and bring them in as mentors for students. There's potential for investors as well, if alumni want to come back and help build companies. I have been amazed at how many people wanted to help, to give back and connect with the school and current students to help them move forward and save them the trouble alumni went through in their entrepreneurial experiences.

Interviewed by **Ashley Spurgeon**

- ▶ Read Werner Kuhr's full interview online at magazine.mines.edu.
- ▶ To learn more about how alumni can get involved with the entrepreneurship and innovation efforts at Mines, check out the new alumni interest group on pages 26 and 27.

ATHLETICS

MINES WRESTLING GIANT GETS HIS DUE



(Top) Jack Hancock meets with current Mines assistant coach Evan Knight during the dedication ceremony.

Photo by Julian Liu

(Above) Jack Hancock gives his remarks at the dedication of the Hancock Wrestling Center on July 20, 2017.

Photo by Tim Flynn



Dedicating nearly four decades to an athletics program is no small feat and ensures one leaves a lasting legacy, both in its athletes and the school itself. Honoring a figurehead in the schools' athletics history, Mines dedicated the Jack Hancock Wrestling Center on July 20, 2017, celebrating the longtime athletics coach.

Hancock, a member of the Mines, RMAC, Northern Colorado and NCAA wrestling halls of fame, served in numerous roles in the school's athletics program over 37 years, including as head wrestling and tennis coach, assistant football coach and head athletic trainer. He was the head wrestling coach throughout his time at Mines, coaching the team to second-place finishes at the 1961 and 1964 NAIA National Championships. He coached tennis from 1955 to 1966 and from 1979 to 1992, and led the Orediggers to 1974 and 1978 RMAC titles. During his tenure, Hancock produced 33 All-Americans.

Nearly 150 alumni, friends, family and current Mines wrestlers gathered for the wrestling center's dedication, coinciding with the announcement of the final piece of the center—the locker room—which will complete the facility and make it the best in NCAA Division II.

"I'm overwhelmed by the number of people here for this special occasion," Hancock said at the dedication, with dozens of his former wrestlers in attendance. "You have no idea what your presence here today means to myself and my family."

"Coach led me through many, many stages of life, first as a coach and teacher, and then as I got a little older as a mentor and confidant and close friend. But most importantly, I can still call him coach," said Mines Hall of Famer Marv Kay, who wrestled for Hancock before going on to a distinguished career as an Oredigger coach and athletic director.

Jack Hancock's Legacy

37 years at Mines

3 teams coached
(head wrestling and tennis, assistant football)

3 wrestling individual national champions

2 wrestling national team runner-up finishes

4 wrestling national team top-10 finishes

2 RMAC tennis championships

4 Halls of Fame Hancock has been inducted to (Mines, RMAC, Northern Colorado and NCAA Wrestling)

33 All-Americans coached by Hancock



Jack Hancock met with current members of the Mines wrestling team along with head coach Austin DeVoe, athletic director David Hansburg and Mines Hall of Famer and former wrestler Marv Kay.

Photo by Tim Flynn

The first piece of the Hancock Wrestling Center was completed in 2010, when the former pool space within Volk Gymnasium was decked over to create a dedicated practice facility for the program. However, the team has used the same locker room since the opening of Volk in 1959. With the roster more than doubling in size since the 1950s, the team has far outgrown the space it needs, and a new addition with modernized lockers, bathrooms and a study lounge will be built in space occupied by the current wrestling and former men's soccer locker rooms.

- ▶ To learn more about the project that will shape the future of Mines Wrestling, visit giving.mines.edu/wrestlingrenovation.



By **Tim Flynn**

For more on Mines athletics, visit minesathletics.com

HELLUVA ENTREPRENEUR

Armed with an education that emphasizes creative problem-solving and advancement, many Mines alumni have started their own businesses and found success in the startup world

By **Emilie Rusch and Anica Wong**



Russell Drummond '13 (pictured) and Kevin Barthelemy '13 created a startup called Roam Oatmeal that creates organic, high-protein oatmeal specifically for backpackers.

Photo courtesy of Roam Oatmeal



Using the entrepreneurial background he gained as a Mines student, Nick Zustak '17 (right) helped Mike Carey (left) found FENIX.AI, a startup company that offers automated patent preparation at a fraction of the cost of the traditional patent process.

Photo by Mercedes White

Nick Zustak '17 was already flexing his entrepreneurial muscle as a student at Mines.

Instead of getting a typical student job to fund his “fun happy times at college,” the chemical engineering and computer science double major started his own online business in his sophomore year, creating patent drawings for law firms.

Now, Zustak is one of the founding members of FENIX.AI, a Boulder-based startup company that offers automated patent preparation at a fraction of the cost of the traditional patent process, using text recognition and artificial intelligence software.

“A lot of small businesses are at a disadvantage. They want to get a patent to protect what they’re doing, but what you normally do is search by word of mouth or Google and find a law firm. They’ll hear you out, but you’ll have to pay them \$10,000,” Zustak said. “We can give you the full patent document, with claims, description and custom drawings, for \$2,000 because we’ve got it so streamlined.”

The recent graduate joins a long history of entrepreneurship at Mines. From the school’s early days to today, Mines has continually adapted to society’s needs, preparing its students to blaze new trails in the research and business worlds.

That commitment is even more evident as Mines launches a new Center for Entrepreneurship and Innovation. Director Werner Kuhr works with internal and external stakeholders to better integrate entrepreneurial thinking into the university’s educational programs, sponsored research and technology commercialization efforts.

Ask Mines alumni-entrepreneurs of all ages and they’re all likely to say the same thing: Not only did their Mines education give them a strong technical background in their chosen field, but it also equipped them with valuable skills for any entrepreneur—the ability to be resourceful, solve complex problems, work on a team and think on their feet.

“It’s not poetic, but you just have to take the jump and do it,” Zustak said. “Mines gave me a great technical background, but they really taught me to tackle open-ended problems and



think from new perspectives. Even if I can solve the problem, I want to hear other people's ideas."

NOT AFRAID TO FAIL

Long before the internet made starting a business more accessible, Mines graduates were successfully forging ahead on their own.

When Lauren Evans '82 graduated with a bachelor's degree in geological engineering, she didn't know she had a natural aptitude for business.

After a short stint with the U.S. Geological Survey, she went into the private sector and watched as company after

company got bought out. It was her parents who encouraged her to strike out on her own.

"I had just bought my house and was not happy at my job and my parents were visiting. My dad and I were sitting on the patio and he said, 'You should start your own company. Your mother and I won't let you lose the house,'" Evans said. "I went in and quit the next day. I didn't have a business plan. I just had good support."

Today, the environmental engineering consulting firm she started in her garage in 1993, Pinyon Environmental Inc., has 70 employees and has contributed its expertise to high-profile projects, including the Regional Transportation District's



Lauren Evans '82 started Pinyon Environmental Inc., an engineering consulting firm, striking out on her own as an entrepreneur and has found success in the 23 years the company has been in business. The Pinyon Environmental team is pictured here in celebration of the company's 21st anniversary.

Photo by Margs Musson

Northwest Rail and Commuter Rail Maintenance Facility, the National Renewable Energy Lab in Golden and the Twin Tunnels on Interstate 70.

Pinyon's services include National Environmental Policy Act compliance and monitoring, storm water permitting, monitoring well sampling, threatened and endangered species surveys, construction dewatering and water quality projects.

"When I talk to people and they ask, 'What should I do to try to position myself to start a company?' I tell them you have to learn how to do everything," she said. "You have to learn how to answer the phones. You have to learn how to put a report together. You have to do marketing, set up an

accounting system. Unless you have an infusion of cash from someone, you're going to be operating on a shoestring. You're not going to be able to hire all the people you're going to want to hire."

As her company has grown, Evans has been able to bring people onto her team with complementary areas of expertise—including her college roommate from Mines, who had more management experience than Evans and could better oversee the company's expanding human resources operations.

Being an entrepreneur also means being willing to risk failure, she said.

"You have to be able to bracket your risk. I didn't want to lose my house, so I found a way to not do that," Evans said. "You have to be willing to risk professional failure. You may have to go back and say, 'I tried this. It didn't work. Now I have to go find a job.' Most entrepreneurs are more comfortable with that possibility of failing and taking some financial risk."

It was her time at Mines that taught Evans some of the soft skills she relies on every day—how to solve problems, stay calm and not get overly stressed, she said.

"It's funny, when I went to geology field camp, it was six weeks of camping. It was pretty long days and hard work," Evans said.

"When I was working for other companies and working on the north slope of Alaska in winter, I remember several times thinking it's still better than field camp. I'm warm. I have a light to work with. I'm not working by candlelight," she said. "It does prepare you."

DEDICATION TO QUALITY

It was during a packrafting trip in the deep Patagonia backcountry that Kevin Barthelemy '13 first ate an oatmeal blend made from carefully selected local ingredients.

When he got back to the States, he connected with classmate Russell Drummond '13, and the two headed out to camp in the Oregon wilderness. Barthelemy introduced Drummond to the oatmeal he brought back from South America, and the two realized there could be a market for an organic, high-protein oatmeal targeted specifically for backpackers.

Armed with a flavor they loved—chocolate peanut butter—and a dedication to putting quality ingredients into their product, they started looking at the piece that was going to be critical to the success of Roam Oatmeal—packaging.

"For backpackers, oatmeal cups don't really work," Drummond said, explaining that making the packaging as small and useful as possible for space-conscious backpackers was key.

They wanted their customers to be able to make the oatmeal in the slim package while out on the trail, so they had to find a material that could hold boiling water. They started tracking down a product with the functionality of a high-temperature



Determining Roam Oatmeal’s package design required the use of skills the company’s founders learned as Mines students, merging their engineering and entrepreneurial backgrounds to create a viable product and launch the startup.

Photo courtesy of Roam Oatmeal

plastic outer layer and a food-safe foil liner, landing on a company in Illinois.

“For our bags, there’s a spec sheet with a bunch of oxygen transfer numbers, and going back to freshman chemistry, some of those things come in handy,” Drummond said.

Through the process of designing the packaging and getting certified as an organic product, Drummond and Barthelemy used skills they learned while in several project-oriented classes at Mines, including senior design and EPICS. Being able to break down each problem and solve it through multiple steps has been a defining characteristic of the duo’s business.

“I also took economics and business classes at Mines and an entrepreneurship class that has been very useful,” Drummond said.

Roam Oatmeal officially launched in April 2017 and is currently sold in a few retail outlets in Portland, Oregon, and on Roam’s website. Drummond hopes to expand into Colorado—Denver, specifically—soon.

“With something like this, a slow rollout works better. It helps to take in feedback and learn from your process and have other people try it out. It’s easy to get feedback from friends and

family, but it’s good to get it out in the world and have people who are paying for it give you feedback,” Drummond said.

INNOVATION AT WORK

When Cooper Newby ’12 was working temp jobs, he noticed a lot of inefficiencies when it came to staffing.

Getting workers signed in took too long, and sometimes jobs were delayed or even cancelled. Newby noticed that during these down times, people would stand around on their phones, waiting for something to happen.

There was an opportunity to change the process and make the temp job experience more rewarding so Newby, who went on to Stanford University for a master’s degree, worked with fellow Cardinal Gino Rooney to create BlueCrew.

“We met in an entrepreneurship class and resonated on the issue of automating all of the manual processes that a staffing agency usually does. We wanted to build that community with a mobile app. From there, we struck a chord, got our first client and decided to take the leap and go into business after we graduated,” Newby said.



To help people find better jobs, Cooper Newby '12 created an app called BlueCrew to connect employers with potential temporary employees. Here, Newby is pictured (right) with partner Nick Jones '13, BlueCrew's first employee.

Photo courtesy of Cooper Newby '12

Newby hired his EPICS partner, Nick Jones '13, as the first employee of BlueCrew because he knew they both had the Mines mindset and the ability to think about a problem analytically, break it down to its components and then work through those pieces until a solution materialized.

Prepared with their engineering, design and data backgrounds, the team created an algorithm and app that help

hands. Those are single mothers, veterans and others across the spectrum," Jones said.

The trails Mines alumni blaze next remain to be seen. But given the school's long history of encouraging entrepreneurship, more success stories are likely just around the bend.

employers find and reward the best employees.

Workers create a short profile on the app and have almost immediate access to jobs that range from janitorial to concessions to warehouse work and more. BlueCrew offers incentives for employees to perform well on jobs and employees and employers can rate each other, making sure both parties have a quality experience.

BlueCrew has been called the Uber for work, but Newby is quick to point out that what makes their company innovative is that employees are protected by traditional W-2 employment, which includes worker's compensation and other benefits that allow employees to take care of their families while learning new job skills.

"We wanted to empower a large amount of people to 'try before they buy' and find the job that fits," Newby said.

BlueCrew hopes to change the way people find and do work while striving toward the goal of making sure everyone has equal access to quality jobs while enjoying the securities of W-2 employment. The app is currently available in the San Francisco Bay area, Sacramento, Los Angeles and New York, with plans to launch nationwide.

"The most rewarding thing for me since joining BlueCrew is seeing the changes we've been able to make in our employee's lives. We've put several million dollars of wages into people's

CATALYZING CHANGE

By Mark Ramirez

University Innovation Fellows bring an entrepreneurial mindset to Mines



Between campus jobs, Greek life, volunteer work, intramural sports and, of course, the school's rigorous academics, Mines' 2017 University Innovation Fellows have pretty packed schedules.

So it's both ironic and appropriate that these four go-getters—Sarah Ingram, Emma May, Tanner McAdoo and Sam Warfield—have added a pretty big project to their agendas that's meant to help their peers tune out the demands of academic life, if only for a little while.

Early this year, they were the latest group of Orediggers to undergo six weeks of training on design thinking (a specific approach to problem-solving that combines creativity and analysis), the lean methodology and how to map their entrepreneurial campus ecosystem. They joined 350 students and faculty members from 80 colleges and

universities from around the world for the UIF program's Silicon Valley Meetup, held March 9-13 at Stanford University's d.school, and came back ready to change their campus.

At the top of their list is a plan to transform part of a lounge in the Ben Parker Student Center—just past the bookstore—into a space for relaxation and low-stakes creativity.

"We definitely want fun seating—bean bag chairs, comfy couches, chairs where people can decompress and relax a bit," said Ingram, a chemical and biological engineering major who took the lead on the project. Also on the shopping list are easels, paper and paint, drawing supplies, maybe whiteboards on the walls for fun doodles and perhaps Legos or other creative toys.



University Innovation Fellows Tanner McAdoo, Sarah Ingram, Emma May and Sam Warfield underwent six weeks of training in early 2017, learning about design thinking, lean methodology and how to map an entrepreneurial ecosystem to implement new ideas and build an entrepreneurial community at Mines.

Photos by Joe DelNero

“The intent is to get ourselves in a better state when we’ve had a really stressful day,” Ingram said. “Mines is a fast-paced place, and there are plenty of study areas and makerspaces, but there’s not really the other side of things.”

Warfield, a computer science major and tuba player who’s been wanting to get into painting, knows the value of participating in artistic activities. “It lets me unwind, but it also engages a different side of my brain,” he said. He’d love to see some musical instruments in the space but realizes they’re on the larger and pricier end of the spectrum. “One of the best ways to get new ideas is just being thrown into a different environment,” he said.

“We want to foster that sense of creativity on campus,” Ingram said. “We want students to see people having fun

and smiling and say, ‘Yeah, I want to do that.’”

Ultimately, though, the STEAM Vent—the working name for the space—is about easing the pressures students sometimes feel. “It’s a place to unplug from Mines and not be reminded that you have so many things to do,” Warfield said.

The group received \$3,440 from the Mines Philanthropy Council to purchase materials and found willing partners in Mines administrators, including Dean of Students Derek Morgan, who worked with them to secure the space.

“Mines is a small campus, so making sure there’s a physical location and then getting permission to use that space was a challenge,” said McAdoo, a metallurgical and materials engineering major. “The team went on an exploratory mission—we split up and scoured campus and found a couple of places just by keeping our eyes open.”

The process has required putting the communication skills the team has learned to the test. “You really have to make it worth their while to listen to your ideas,” Ingram said. “Not only why you want it but why other students should want it even if it doesn’t benefit them directly.”

Ingram said she’s gotten much better at communicating via email, contacting what she calls “important people,” making connections and holding her own. “I didn’t see myself doing this side of engineering—the logistics and background work. I’ve really enjoyed it so far.”

The idea for the space is grounded in what the fellows have heard from other students. They surveyed campus to find out if this kind of space would be something students want. “We’ve gotten a lot of feedback about the need for a place like this,” Ingram said.

“Students are anticipating this, but they don’t know what to expect. I don’t know what it’s going to look like,” McAdoo said. “It’s not a million-dollar project—it’s very much an experiment for students, by students, and one we hope will be successful.”

“Our end goal is to make it permanent,” Ingram said. “If we get a great response, we’ll want to spread it to other places on campus.”

While this project has been front and center, the fellows have plenty of other irons in the fire, bringing to bear both their innate talents and the skills they’ve learned



SARAH INGRAM

CHEMICAL & BIOCHEMICAL ENGINEERING



SAM WARFIELD

COMPUTER SCIENCE

through their UIF training, which was funded by the dean of the College of Engineering and Computational Sciences, Kevin Moore.

Moore says this third cohort of Mines fellows continues a pattern of successful innovation. “I think they’ve made a huge difference,” he said, citing the creation of themed learning communities, makerspaces and innovation competitions. “They came back from their training poking and prodding and building this great groundswell,” Moore said.

May, a computer science major, came back from the Silicon Valley Meetup eager to put ideas into action. She’s been working for Mines’ new Center for Entrepreneurship and Innovation—which was established in part due to the efforts of previous University Innovation Fellows. In addition to building the center’s website, May is working with Director Werner Kuhr to develop events throughout the school year—startup weekends, innovation workshops and the like.

In that vein, May wants to organize a hackathon. The term usually refers to events where computer programmers quickly brainstorm and execute software projects, but what May has in mind would take on Mines itself. “It would be a learning hackathon, focused on learning design-thinking principles and what students can improve on campus,” she said. “It’ll be a low-stakes trial, and then we’ll do a bigger one.”

May is surprised that Mines hasn’t put together such an event already. “We have the culture for it, but we just haven’t done it,” she said. “We should be a hub for that.”

What May is most excited about this semester, however, is working with Program Director Leslie Light to revamp Cornerstone Design@Mines (formerly the Engineering Practices Introductory Course Sequence, or EPICS), a sequence of courses that aim to build students’ confidence in applying fundamental design concepts to solve complex, open-ended problems. All Mines students are required to take at least one cornerstone course.

“I think it should be the most fun class students take,” said May, who has heard some feedback from students with problems she thinks she can help address. “I want to help improve the rapport between students and faculty and making it more collaborative—I have big dreams for it,” she said. “We’re incorporating more design-thinking principles, more active learning, more activities.”

One issue has been team projects, where some students feel the workload has not been distributed evenly. One way to address this would be to talk more about leadership styles in the class. “I have had a lot of leadership training, and it has made my group experiences a lot better,” May said.



TANNER.MCADOO

METALLURGICAL & MATERIALS ENGINEERING



EMMA.MAY

COMPUTER SCIENCE

McAdoo has other ideas. He is serving as a peer mentor this semester, meeting with 30 freshmen once a week and guiding them through the M Climb. He's also recently discovered the group Student Advocates Against Violence and for Education on campus and sees it as an opportunity for him and his fraternity, Kappa Sigma, to make a difference. But his big idea taps into his current passion for Greek life.

"I see a lot of potential in the fraternities and sororities," McAdoo said. He wants to see Greek life have a bigger role at Mines, to bring more of the energy and social skills that members have across that 120-yard divide between their houses and campus.

McAdoo also wants more Mines students to consider joining Greek life, which will require challenging misconceptions on both ends. "Seeing huge fraternities and sororities at other schools, the stereotypes, it wasn't something I wanted to participate in," McAdoo said. "But here at Mines, they're awesome social groups of kids just like me. And students here don't always realize their full potential as social animals."

"We are all Orediggers. We've all got that something that makes us special," McAdoo said.

Like McAdoo, Ingram wants to better integrate a segment of the campus population into the Mines community. "Our international population is so large, but it feels kind of isolated," she said. She noted that international students often connect with one another, "but I'm wondering how to create a more inclusive feeling between them and everyone else."

Events are the first thing that come to mind, Ingram said. Common spaces can also bring people together on a fundamental level, especially when everyone experiences similar stressors.

Another of Ingram's goals that's more of a "moonshot" is to organize and eventually host a regional meetup for University Innovation Fellows from various institutions. "I would love to recap with them, see what they're doing," she said. "I'm always in contact with other fellows on Facebook and elsewhere, even as far away as India—it's super awesome to see the progress they're making."

Both May and McAdoo said being willing to risk failure has been key to their own progress. While the stars have aligned so far, "you have to be okay with getting shut down," May said. "That's how you're going to learn."

According to McAdoo, "You have to be able to take that leap."

A LASTING SHOWPIECE

GUGGENHEIM HALL'S LEGACY AFTER MORE THAN 100 YEARS ON CAMPUS

Photo by William Ciccone

With a radiant gold-leafed dome atop its bell tower, a terra-cotta roof and stone foundation, Guggenheim Hall has been a landmark at Mines for over 100 years. A structure that has housed events and classrooms, a public museum and a library over the years, Guggenheim Hall has evolved from an all-purpose building in the early 1900s to the iconic administrative space it is today.

Back in 1905, Simon Guggenheim, a wealthy philanthropist with a passion for higher education, made a generous gift to Mines. His \$90,000 donation—the largest private donation received by a Colorado public institution at the time—resulted in the construction of the eye-catching building that has become a symbol of Mines and a landmark of the community.

Given that the Guggenheim family fortune was made in the mining and smelting industries, a donation to Mines seemed the perfect fit. Around the time of his initial donation to Mines, Guggenheim also made other significant contributions to fund buildings at the State Teacher's College, the Colorado Agricultural College and the University of Colorado.

Mines held a cornerstone-laying ceremony on Oct. 2, 1905, and Guggenheim Hall—designed by architect James

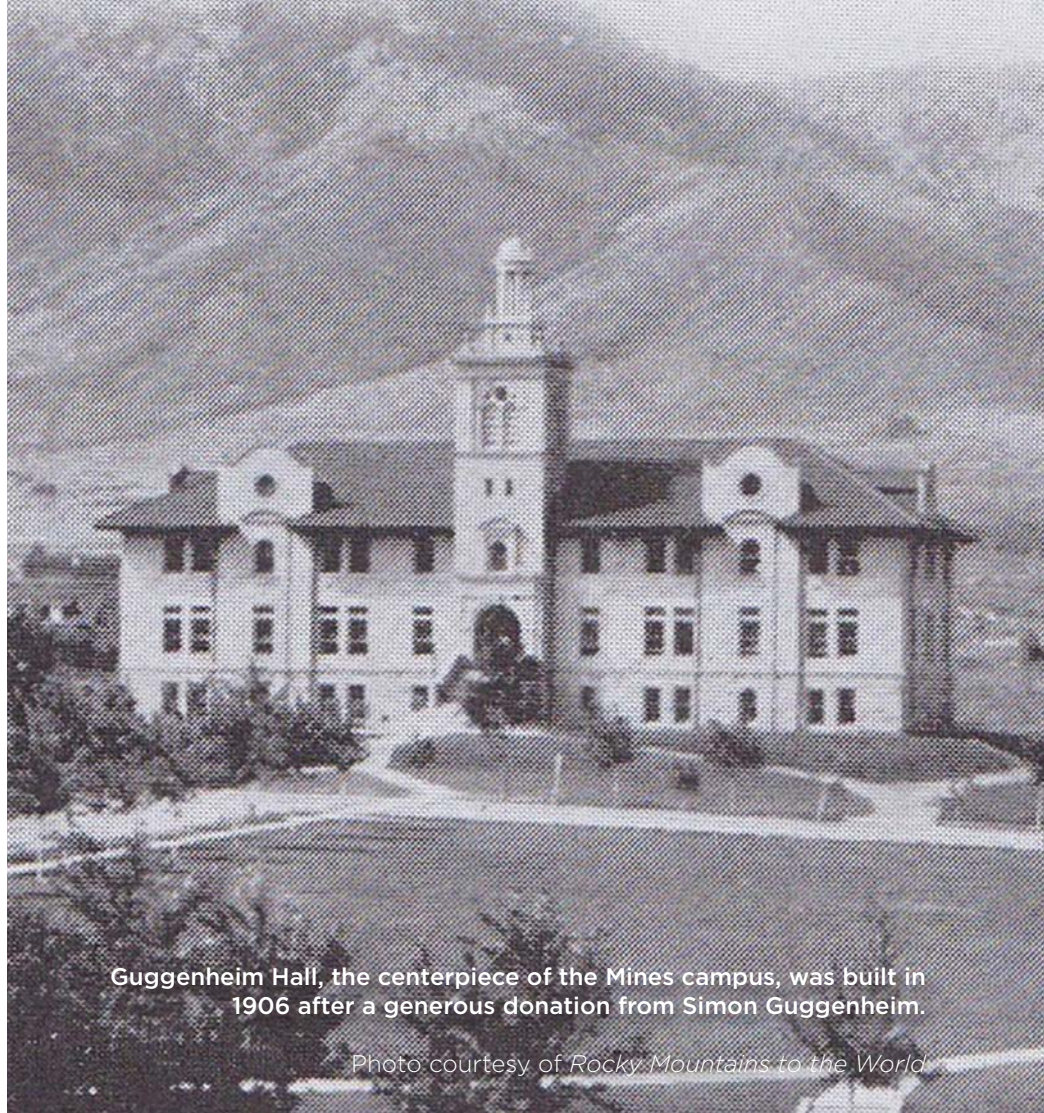
Murdock—was officially dedicated a year later on Oct. 17, 1906. The *Golden Transcript* wrote that business in the city would likely be suspended in honor of the ceremony.

During Commencement in 1906, Mines President Victor C. Alderson announced that Guggenheim had donated an additional \$10,000 to help furnish the hall. At the time, there were only five other buildings on campus: Jarvis Hall (Mines' first building); Chemistry Hall, aka "Old Main;" Engineering Hall; the Assay Building; and Stratton Hall.

Guggenheim Hall was certainly a standout addition to campus. "Clearly, given the other buildings that were on campus—we had these huge massive brick and stone buildings with some architectural detail—this one was outright fancy for the time," said Lisa Dunn, special collections manager at Arthur Lakes Library. "This was the elegant building."

She said the hall was primarily all-purpose when it was first built but turned into office space as the century passed.

In its early life, the hall provided a home for a large public museum and the geology, geophysics and mineralogy departments on the first floor; space for the library and president's offices on the second floor; and an auditorium, lecture rooms and the Department of Mathematics on the third floor.



Guggenheim Hall, the centerpiece of the Mines campus, was built in 1906 after a generous donation from Simon Guggenheim.

Photo courtesy of Rocky Mountains to the World

The building's foundation started to settle quickly after its completion, said Chris Cocallas, university architect and executive director for capital planning and design. In the 1920s, Guggenheim donated additional funds to reinforce the bell tower and install a drainage system to stabilize the foundation.

"My guess is that the building got used in its original state for quite a long time—from the time they built it to maybe the 1960s," Cocallas said. "At that time, people were more comfortable in environments that may not be what we are used to today. The 1960s, I think, is when they added the cooling system; that's when they did mechanical and electrical updates to make it a modern building for the time."

The updates made in the 1960s and 1970s are most of what we see in Guggenheim Hall today. "We've changed things here and there over the last 10 years," Cocallas said. "Nothing major though, a wall here, a wall there."

However, much of the surrounding exterior of the building has changed to allow for an expanding campus. The sidewalk that now runs east to west through Kafadar Commons was originally a dirt road, and while the original bell no longer hangs in the tower, an electrical tone still rings every hour on the hour.

The front of Guggenheim Hall remains similar to its original state, while the rear is very different. "In earlier pictures, you see a stairway going up from the west entrance, similar to the other side," Cocallas said. "At some point they raised up the grade and leveled it."

Even with a handful of repairs and restorations, Guggenheim Hall remains "a remarkable display of the impact of mineral wealth in Colorado at the turn of the last century," according to the Colorado Cultural Resource Survey's Architectural Inventory Form. "It is a symbol of the Colorado School of Mines' position as a benefactor institution for such minerals-industry magnates as Simon Guggenheim."

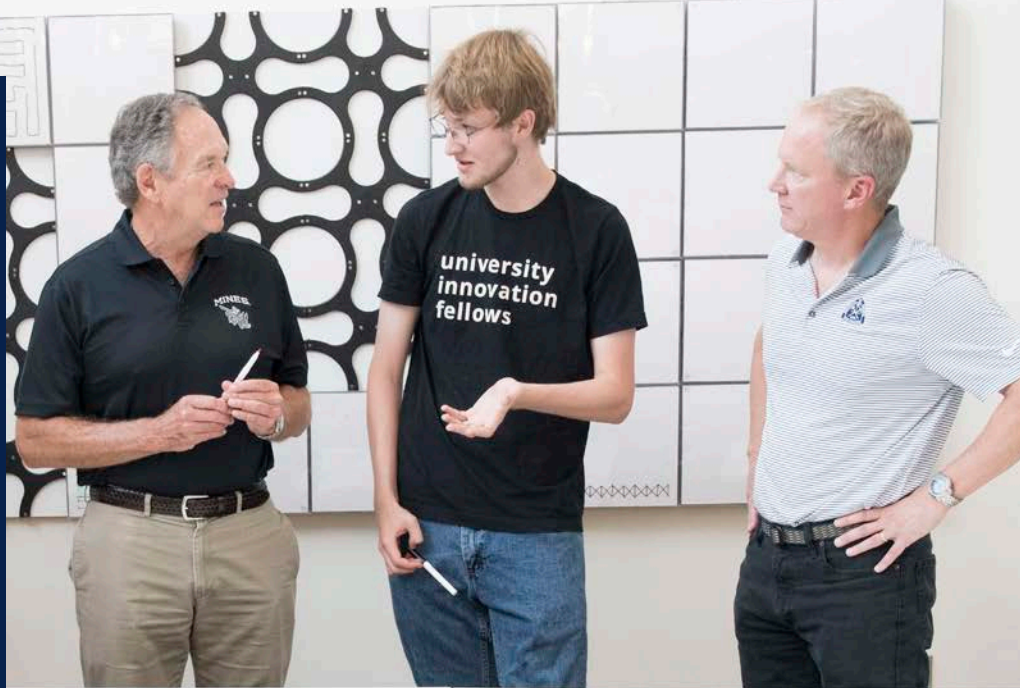
Still a hallmark building on campus, many recognize the symbolic Guggenheim bell tower as a reminder of Mines' rich history, more than a century later.

By **Christina Vessa**

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- ▶ Do you want to help us tell Mines' stories? If you have photos, small artifacts, programs or any other related relics you would like to share, contact Lisa Dunn in Arthur Lakes Library at [303-273-3687](tel:303-273-3687) or ldunn@mines.edu.

SHAPING IDEAS INTO BUSINESS VENTURES

A LOOK AT THE NEW ENTREPRENEURSHIP AND INNOVATION ALUMNI INTEREST GROUP



The Entrepreneurship and Innovation Alumni Interest Group works to better define and prioritize the culture of enterprise at Mines and provide better business connections for students and alumni.

Photo by Joe DelNero

Mines has always had a strong culture of innovation, but turning great ideas into successful businesses hasn't always been a well-known focus of the university. Today, however—thanks to a revamped entrepreneurial and innovation emphasis on campus and a new alumni interest group—that's starting to change.

Earlier this year, Mines created a new Center for Entrepreneurship and Innovation to better define and prioritize an inventive and enterprising environment on campus while providing better business connections for students and alumni. But Mines President Paul C. Johnson recognized there was additional alumni potential, with a readily available group who wanted to contribute their talents and skills to bolster Mines' efforts in these areas. As a challenge from President Johnson, the Entrepreneurship and Innovation interest group was formed to get Mines graduates to view technology innovations through a business lens, to bring the campus and alumni communities together and to find new ways to add value to the world.

Many alumni, including Stu Bennett '66, eagerly volunteered. "We started working with faculty, staff and people in the community involved in the culture of entrepreneurship," he said. Out of these discussions, the interest group was off the ground.

BUSINESS EXPERTS READY TO HELP

Today more than 20 people have joined the interest group and are creating an expanding network of business experts—some of whom are Mines graduates

themselves—to help alumni turn bright ideas into potential moneymaking ventures.

"We have volunteers lined up: patent attorneys, angel investors, a startup accelerator, business brokers, accountants, corporate planners. It's all the talent you need to put a business together," Bennett said.

The goal is to invite experts to give seminars and meet with individual alumni for in-depth discussions and business planning sessions. This can include everything from teaching a short-term business course to creating a pro forma statement for projecting financial results. The school's new Center for Entrepreneurship and Innovation has provided media facilities where interest group experts will create videos explaining business incubators, angel investors and the essentials of making a business case for an idea. The videos will be available on the center's website, helping to spread the word about the group and assist people outside the Golden area.

REAL-WORLD EXPERTISE

The interest group works with companies that support startups, including Traxion, a startup accelerator in Golden that works with innovative companies in the science and technology sectors.

"We're an off-campus resource. We help bring real-world components to the world-class engineering and technical education that Mines provides," said Traxion partner Bud Rockhill. The company helps alumni develop and analyze business plans. It also connects startup companies with

alumni who don't want to start their own business but are interested in helping a startup. "Instead of feeling like you have to invent something, you can join a team to accelerate the growth of an existing startup," Rockhill said.

Traxion also works with Mines students. This spring, the Traxion partners advised student teams competing in an entrepreneurship challenge sponsored by Newmont Mining, holding weekly classes condensed from its program for real-world startups. The students were taught how to reach out to industry experts and potential customers for feedback on the feasibility and pricing of their ideas.

As a result, some teams modified their ideas to better meet the needs of potential customers and companies—something many entrepreneurs fail to do, Rockhill said. "A lot of well-intentioned people fall in love with their own ideas and don't ask customers about them until after they've built something nobody wants," he said.

To keep abreast of the burgeoning interest in entrepreneurship at the school, the alumni interest group works with Kevin Moore, dean of Mines' College of Engineering and Computational Sciences and the academic leadership representative for the interest group. Responding to comments from students who wanted spaces and tools to develop their ideas, Moore worked with the university to create the Blaster Design Factory and other spaces, where students can do low-level prototyping or other specialty work. Moore has also helped find corporate sponsors for student competitions.

Mines also made updates to the curriculum, providing entrepreneurship classes that were listed in the catalog but hadn't been taught in at least a dozen years, Moore said. With the opening of the Center for Entrepreneurship and Innovation, the entrepreneurial momentum is bound to accelerate.

That's a good thing, Bennett said. "If statistics are correct, the current crop of graduates aren't going to have three

or four jobs, but five or six careers in their lives. Knowing how to be flexible and entrepreneurial might be critical to their survival."

VALUABLE NETWORKS

Despite the strides they have already made, the interest group seeks more alumni participation in its growing network of experts.

The Entrepreneurship and Innovation group is one of several new alumni interest groups that were formed following the Office of Alumni Relations' switch to a free membership model. With many more connected alumni, it made sense to develop interest groups.

"Entrepreneurship and Innovation is one of the stronger groups we've currently got going," said Damian Friend, who, as the alumni association's executive director, helps the groups develop templates for goals, programming and budgeting. Each group is overseen by an alumni board member and a Mines faculty member. Friend helps them create individual charters.

The Entrepreneurship and Innovation group meets monthly and will hold lectures and panel discussions that both alumni and students can attend. "There's a lot of free-flowing ideas and information," Friend said.

The interest group fills a need for graduates who may become entrepreneurs someday, even if that wasn't part of their original plan. Bennett, who opened a dental practice after working as a chemical engineer for several years, said he could have used the group's help himself if it had been available. "I had no idea how to start a business," he said. For graduates who do have business expertise, the interest group provides a way to give back. Bennett said, "We want to be a hub both for alumni seeking business services and for alumni who want to give back and help others take their ideas to market."

By **Teresa Meek**

BE AN ENTREPRENEUR OR HELP FELLOW ALUMNI

Do you have an intriguing technology idea that you're not sure how to develop? The Entrepreneurship and Innovation alumni interest group may be able to help. Its expert advisors can help you develop a business plan and vet your idea for feasibility, making sure you're on the right track before you invest your time and money.

Maybe you don't have an idea, but would like to participate in the exciting world of startups. If you have expertise to share or just want to get involved,

the interest group would love to talk to you. And if you're too busy to get involved right now, you can help by spreading the word.

You don't have to be a Mines graduate to join the alumni association or its interest groups. Mines family members, friends and community members are all welcome.

For more information or to get in touch, visit minesalumni.com

► Check out the other available alumni interest groups on page 29.

ALUMNUS PROFILE

INVADING CAIRO: BRINGING SPORT AND COMMUNITY TO EGYPT

Over the past year, Alex Beaman '14 invaded one of the largest cities in the world. A Mines alumnus with a degree in engineering physics, Beaman stormed Cairo armed with nothing but a 175-gram round, plastic disc, with the intention of bringing ultimate to the city.

Played by an estimated 7 million people around the world, ultimate—better known as ultimate Frisbee—is a unique, fast-paced sport that combines the flow of soccer with the aerial passing and catching of football. The object of the game is to score by catching a flying disc in the opposing team's end zone. The player with the disc can pivot, but cannot run, which means teammates without the disc must sprint to get in an open position to advance the disc down the field. Ultimate also emphasizes fair play through the "Spirit of the Game," a tradition of sportsmanship where players call their own fouls.

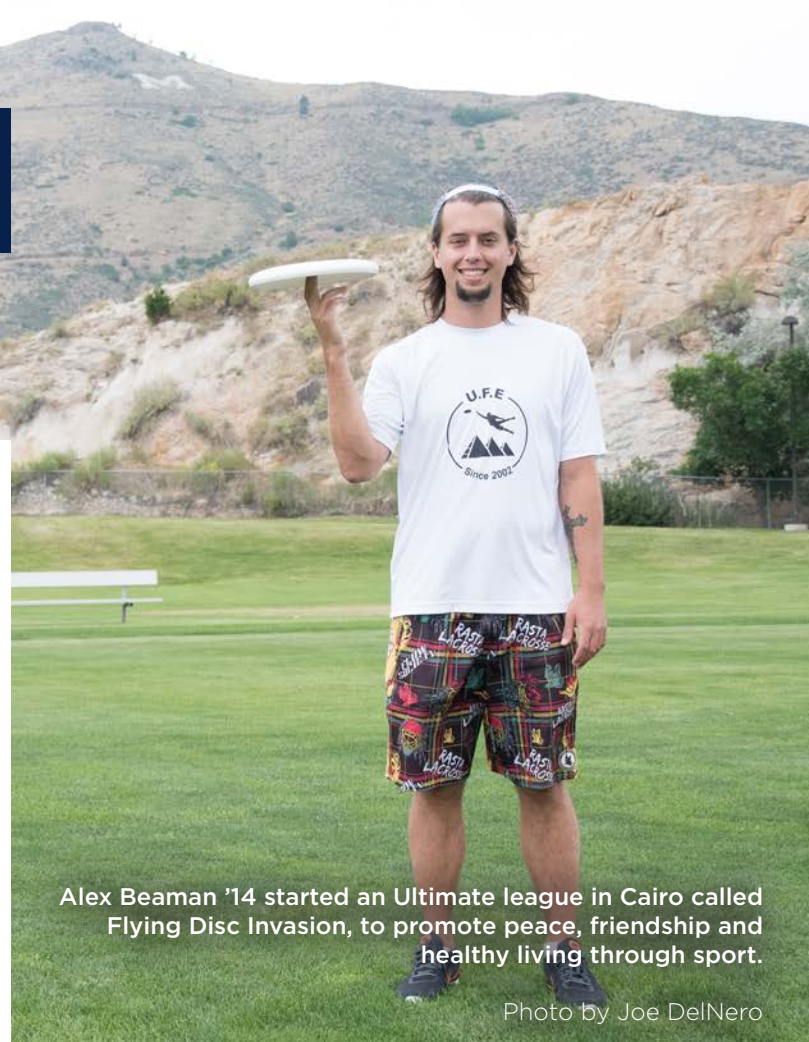
Beaman arrived in Cairo in September 2016, following his sister who moved there a few years earlier. He immediately started looking for the ultimate community. He had previously played as a Mines student and when he lived in Wisconsin, so, naturally, Beaman was excited to be a part of an international community. "I started playing ultimate my junior year of high school," Beaman said. "My sister actually taught me how to throw a forehand."

However, despite being a city of millions, there was only one established ultimate team in Cairo. Beaman and Daniel Amoun Louis, another ultimate player in Cairo, wanted more. They teamed up to form the Flying Disc Invasion (FDI). Their mission: invade Cairo with an exciting sport that encourages peace, friendship and healthy living.

"We got about 10 other people to join us half-heartedly," Beaman said. "We did disc walks where we took discs to different parts of towns. There weren't really open fields to play, so we had to either find a soccer field or throw on the street or sidewalk."

Beaman and Louis established The Invasion Foundry to train players and coaches to develop a higher level of competition and generate interest in the community.

"The biggest challenge was getting people excited about ultimate," Beaman said. "When we started the foundry, not many people were interested, because they just didn't know what ultimate was. Slowly but surely we got to where we are today."



Alex Beaman '14 started an Ultimate league in Cairo called Flying Disc Invasion, to promote peace, friendship and healthy living through sport.

Photo by Joe DelNero

The FDI now has a core team of six or seven organizers with more than 20 consistent volunteers and helpers.

"Now we are planning a beach ultimate tournament," Beaman said. "So far, we have about 90 people signed up. There are some people from the U.S. and the U.K. signed up, and some people from Morocco just reached out, so there's some international attention to this."

Another major initiative of FDI and ultimate organizations around the world is supporting the development of women in the sport. "Gender equality is one of the selling points of ultimate for me," Beaman said. "There's this big cultural challenge but we really want to start a women's team." If successful, it would be the first all-women ultimate team in Egypt.

To help expand the invasion and boost these initiatives, the FDI is growing their web presence through Facebook, Instagram and their website. They use these platforms and their events to continue to emphasize the importance of an active lifestyle, friendship, peace and fair play.

"Before and after Frisbee, everyone is friends," Beaman said. "It's about having fun more than winning."

By Joe DelNero

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Join a Mines alumni interest group to learn about industry-focused opportunities and stay connected with others from the alumni, faculty and student communities. Whether you're interested in the latest news at Mines, connecting with faculty, networking and attending events or sharing your expertise, there are many ways to get involved.

The newly formed Aerospace Interest Group kicked off its inaugural event, Trajectories 2017: Refuel your Aerospace Network on September 8. More than 150 students, alumni, faculty and professionals in the aerospace industry were in attendance to network and learn, co-hosted by the American Institute of Aeronautics and Astronautics—Rocky Mountain Section. In addition to networking, four speakers gave short, inspirational presentations that included: The Lunar Cycle by Dr. Laoucet Ayari, Orion: NASA'S Deep Space Exploration Program by Charles Lundquist, Boom Supersonic: Building the First Economical Commercial Supersonic Airliner by Erin Fisher, and Space Resources by Dr. Angel Abbud-Madrid.



Visit minesalumni.com/aerospace for more information.



Do you work in an area related to leadership in social responsibility, including stakeholder engagement, community conflict, sustainability, corporate social responsibility, humanitarian engineering, community development work or overseas service, like the U.S. Peace Corps? If so, share your story of how your Mines experience helped prepare you for success, share your expertise with students in the classroom or schedule a time to be filmed.

Visit minesalumni.com/LSR to sign up.

The Mines Music Department will be heading to Vietnam March 21-31, 2018 for their annual music and culture trip over spring break. The music trip is offered to students, alumni and friends who are interested in experiencing Vietnamese culture, cuisine, language and music.

To learn more about this trip, visit minesalumni.com/Vietnam or contact Dr. Robert Klimek at 303-384-2073.



There will be opportunities for alumnae to share their stories and experiences with accepted female students at the Admissions Department's 'Making the Connection' events on Nov. 17, 2017 and Feb. 23, March 16 and April 6, 2018. We also encourage you to get involved by writing postcard messages or making phone calls to accepted female students to encourage them to say "yes" to Mines.

Visit minesalumni.com/womenofmines to learn more.

► To learn more about any of these opportunities or volunteer, visit minesalumni.com/interestgroups or contact Damian Friend at dfriend@mines.edu or 303-273-3154.

OREDIGGERS GIVE BACK

SUPPORTING CRITICAL THINKERS

Don Thorson '55 has been an innovative problem-solver since his earliest days growing up on an oil field in Newcastle, Wyoming. When he was six years old, he found an abandoned eight-foot oil tower. "I could make myself a drilling rig and I could drill holes in the ground with that. It worked just like the big ones did," Thorson recalled.

His father, who first owned a small oil field containing five wells and then went on to mine bentonite, was always trying his hand at different things and encouraged Thorson to think about problems with fresh eyes. In his teenage years, Thorson would watch what other people were doing and how the specialized oil and then bentonite equipment worked; he was known for revamping machinery to make it into something he could use for a different job.

Thorson graduated from Mines with a geophysics degree and went on to have a successful career in oil and gas and bentonite production. Bentonite is typically used in drilling mud for oil and gas wells, and has recently been integrated into kitty litter, because it can absorb about 15 times its volume when it comes into contact with liquid.

Because he values the ability to engineer solutions, Thorson wants to help Mines students become critical thinkers. He is a major donor to the senior design program and has judged the competitions for 10 years.



Don Thorson '55 (left) helps Mines students become critical thinkers, and the Thorson First Year Honors Program was created to get students thinking about solutions to real-world engineering problems. Here, Don is pictured with his brother at their family's company, Blackhill Bentonite.

He says that "senior design gives application to real world problems" and is the reason why he has chosen to pay it back and invest in tomorrow's entrepreneurs.

He also supports the honors program, an interest that originated from his ethics work with Hillsdale College, a liberal arts university that grew his interest in the humanities. Through his generosity, the Thorson First Year Honors Program was created. Up to 100 freshmen are accepted into this program each year. The students live together in a learning community, and through a class called Innovation and Discovery in Engineering, Arts and Sciences (IDEAS), they are encouraged to think about how real-world engineering problems can be solved.

"My involvement in the Thorson First Year Honors Program not only shaped my first-year experience at Mines, but also shaped me as a person," said Madison Anderson, one of the select students enrolled as a freshman in the program. "From the first day of class to the last, my professors consistently challenged me to go beyond my comfort zone. They encouraged me to take risks and pushed me to think about the unseen, question the known and challenge the existing norms."

As Thorson looks back on his time in the industry, he knows there was hardly a day when he didn't have to use his creativity and inventiveness to solve problems. He's proud to be able to help Mines students gain those skills.

By **Anica Wong**



Don Thorson '55 pictured on a tricycle in an oilfield as a child.

Photos courtesy of Don Thorson



ALUMNA PROFILE

MAKING WAVES ON WATER ISSUES

Becky Mitchell '02, MS '07 is the new director of the Colorado Water Conservation Board, looking to take on Colorado water supply and demand issues and the preservation of agriculture.

Photo by Anica Wong

For Becky Mitchell '02, MS '07, water is how she can make a difference in the world.

“Water touches everything,” she said, capturing the magnitude of her calling. Mitchell is the new director of the Colorado Water Conservation Board, a state government board that represents each major water basin in the state and works with other state agencies.

After Mitchell received a bachelor's degree in environmental engineering and master's degree in environmental sciences and engineering, she started her career doing engineering consulting work and then landed in Nebraska to work on an endangered species program. But Colorado and water planning kept calling her name, so she refocused her work back to Colorado, and a few local gigs led her to her newest position. As the conservation board's director, she will work with a variety of constituencies to provide statewide policy direction on water issues and the implementation of Colorado's Water Plan.

“I'm hoping the future is collaboration, whether that's within the state or beyond the bounds of the state, with all of our Colorado River states or internationally with Mexico. We're not going to be able to do that without looking at it together and figuring out what the best solutions are and how to meet the needs and work with the desires of all of those parties involved,” Mitchell said.

Mitchell was enthralled with how original water compacts were created in the early 1900s to preserve this

precious resource and likes to keep that history in mind as she's thinking about the future of water in Colorado and across the West.

She points to two big topics she's ready to tackle: supply and demand issues as Colorado grows, and preserving agriculture. Neither is a small feat in a part of the country that has long dealt with water fights, rights and usage. Mitchell is confident, though, that she has the background to chip away at these large problems.

“One of the things that has been key and relevant to everything was the ability to know that most problems can be solved and that sometimes it just takes harder work and dedication,” she said. “I think that was one of the biggest things I learned at Mines.”

Mitchell is excited to work with Mines and other universities across the state that are focusing on innovation and solution-based strategies when it comes to water and hopes to engineer social connections while also supporting the technical aspect of the research.

She said, “I have the technical background to make a positive difference and the skills to logically speak to people about the impacts of actions and use those two things to drive how we move forward.”

By **Anica Wong**

FALL 2017

ON OUR WALL

What advice do you have for recent Mines graduates entering the workforce and starting their careers?

f Your education is not a guarantee; you've passed the smallest part of the rest of your professional career. Be prepared to do what others will not do, regardless of the esteem you may or may not deserve.

-Bill Wathier '02

f Be flexible. Take on the dull tasks and own them. Make yourself invaluable by learning everything you can.

-Ian Lindsay '95

f Be open to career paths outside your field of study at Mines. Engineering skills and problem solving are your greatest assets, and they are applicable to a multitude of environments you will face.

-Ron Breninger '80

f Be confident enough to know that you can be successful professionally, but at the same time be humble enough to seek feedback to improve in the areas needed to progress your career.

-Jason Medina '01



Jobs come and go. Life is short, remember to have fun.

-Brian Briggs '94



Communication skills are as important as technology.

-Greg Brown '76



Everything you really need to know about working with people and managing your career, you didn't learn at school. The real learning begins in your job. Be humble. Be curious.

-Tiffany Brewster '07



If you go into a job where you are managing people or otherwise directing the work of technicians or others, spend the time to learn their job and learn from them. They will be able to teach you a lot that will otherwise evade you.

-Ben Saunders '98

TAKING THE SCENIC ROUTE

MINES ALUMNI, STUDENTS AND FRIENDS
RAFT THE GRAND CANYON



Photos by Ray Priestley '79

Many people have made a trip out to the Grand Canyon to witness one of the most scenic natural spots in the United States. Yet, after standing at its edge and witnessing its awe-inspiring natural beauty, it's only natural to want to get up close and personal with the Canyon's unique landscape and geology. Mines provides that opportunity.

Each May, Mines' Office of Alumni Relations offers a seven-day rafting adventure through the Grand Canyon. In 2017, a group of alumni, students, faculty and friends were led down the Colorado River by geologist and Mines professor Steve Sonnenberg '81. The group stepped back in time through a long chapter of the Earth's geological history, enjoying beautiful hikes and bonding with their fellow adventurers.

"I loved the group spirit that developed during the trip. We arrived as strangers and left as friends. Throughout the trip, we interacted with everyone. Our group included current Mines students and faculty, a couple of college students from other schools and a variety of different vintages of Mines alumni and their spouses," former Mines faculty member Judy Schoonmaker said. "There were

great discussions about careers, training and common experiences at Mines. Even better, I think several long-term connections were established."

"I felt like the group transitioned on that day from a bunch of strangers trying to get to know each other, to friends supporting each other and helping each other have a spectacular experience," added Nancy Newton, parent of current Mines student Stephen Newton.

The group still learned a lot about the scenery and were able to identify the geological differences in the layers of rock along their route. "Steve's lectures about the geology of the Grand Canyon were great," Schoonmaker said. "Each morning he started us off with a short lesson on what we could expect to see that day. As we rafted down the river, he pointed out rock formations and identified the layers."

Everyone in the group agreed: this was a trip of a lifetime. "I wish I did it sooner, post-graduation," said Linda Mohammad '07, MS '09. "I'll definitely do it again in a few years."

ALUMNI NEWS



NEWS

NEW INDUCTEE INTO EAST HIGH ALUMNI HERITAGE HALL OF FAME

Spencer Titley '51 (pictured, left, with Mines Geology Museum Director Bruce Geller) was inducted into the East High Alumni Heritage Hall of Fame at a ceremony at the Denver Art Museum on Sept. 20, 2016. The East High Alumni Heritage Hall of Fame recognizes alumni of the school who have made significant and enduring contributions in their fields of endeavor, elevated the stature of East High School and its students and helped open new frontiers for East High School students and society in general.



TOP FINANCIAL ADVISOR

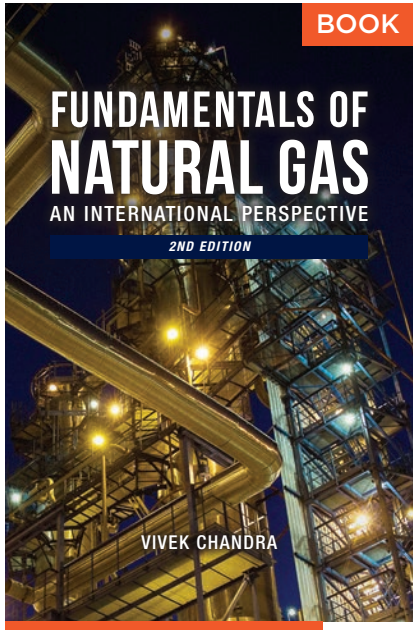
For the second consecutive year, Brent Hablutzel '96 was recognized as a top financial advisor by Barron's magazine in its annual "America's Top 1,200 Advisors: State-by-State" list, published March 6, 2017. To be considered for the list, advisors must have a minimum of seven years of financial services experience and have been employed at their current firm for at least one year. Advisors are judged based on client assets, return on assets, client satisfaction and retention and community involvement, among others. Brent currently works for Merrill Lynch Wealth Management in Greenwood Village, Colo.

NEWS



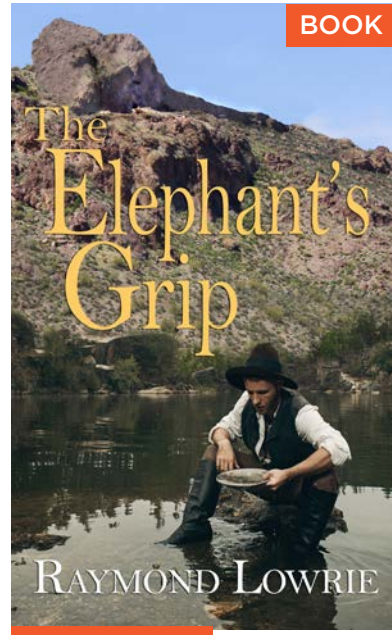
ALUMNI GATHER AT METALLURGY SYMPOSIUM

In June 2017, the Advanced Steel Processing and Products Research Center (ASPPRC) at Mines and the Association for Iron & Steel Technology sponsored an International Symposium on New Developments in Advanced High Strength Sheet Steels. Nineteen Mines alumni participated in the symposium, highlighting the impact Mines and the Department of Metallurgical and Materials Engineering has on the international ferrous metallurgy community. Mines Professor Emmanuel De Moor and Professor John Speer were also on the conference organizing committee. Back row: Kip Findley '01, Mark Blankenau '90, PhD '96, Matthew Merwin '97, Grant Thomas MS '09, PhD '12, Dean Pierce, Oğuz Gündüz MS '92, Emmanuel De Moor, Benjamin Albu '14, Kirk Erven MS '90, Whitney Poling MS '12, PhD '16. Front row: Matt Enloe PhD '13, Chad Gentry MS '99, Eric Gallo MS '95, Sriram Sadagopan, Luis Garza MS '03, PhD '06, Larrin Thomas PhD '15, Nobuhiro Tsuji, Rongjie Song, Hokook Lee PhD '04.



FUNDAMENTALS OF NATURAL GAS

Vivek Chandra '88 published the second edition of his book *Fundamentals of Natural Gas: An International Perspective*. This new edition explains the evolution of natural gas and LNG, including technological advances and new reserves. Chandra delves into the growth of unconventional shale gas technology and production, the rise of LNG export projects from the U.S., international adoption of gas-on-gas pricing and the impact of LNG mega-projects and the adjusting economics of these ventures. (PennWell Books, 2017)



THE ELEPHANT'S GRIP

Raymond Lowrie MS '72 recently published a novel, titled *The Elephant's Grip*. The narrative follows main character Jeremy as he joins the Pikes Peak gold rush of 1859. The novel's characters face many dangers and issues related to mining and the gold rush and struggle through the rugged terrain and 19th century life. (The Wild Rose Press, 2016)



EARLY CAREER RESEARCH PROGRAM AWARD

Kelly Chipps, Physics '03, PhD '08 was selected to receive a Department of Energy Early Career Research Program Award. The Early Career Research Program supports the development of individual research programs of outstanding scientists early in their careers and stimulated research careers in the disciplines supported by the DOE Office of Science. Kelly was one of 59 selectees for fiscal year 2017. She currently works at Oak Ridge National Laboratory in Oak Ridge, Tenn.

[Photo by Jason Richards/Oak Ridge National Laboratory, U.S. Dept. of Energy]

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WEDDINGS



A NEW FUTURE TOGETHER

Rachael Barnett '17 and JP Skeath '17 were married on May 27, 2017, in Philadelphia. JP and Rachael met during their freshman year at Mines, both living on the Visual and Performing Arts floor of Maple Hall. They recently moved to Atlanta, where JP is pursuing a master's degree at Georgia Tech and Rachael is working as an iOS app developer. Several Mines students and alumni attended the wedding, including Amy Goldstein '17, Nick Booth '17, Garrett Kintzele '17 and Nico Pampe '17.



LOVE OVER CLEAR CREEK

Alexandra Hall '12 married Matt McGavin '13 on June 3, 2017, in Golden, Colo., at the Golden Hotel. Matt and Alexandra met as students at Mines, and Matt proposed on the bridge at South Golden Road overlooking Clear Creek in September 2015. A large number of Mines graduates attended the wedding, and they all sang the Mines fight song on the dance floor just before the reception ended. Back row: Karvel Haug '15, Matt Kreutz, Oliver Dewey '12, Daniel LeVon '12, Nabeel Babbitt '13 (best man), Sarah Kelly '14, Ginny Judge '14, MS '17, Bryan Euser '11, PhD '16, Tyson Williams '12, MS '13 (groomsman), Tanna DeRuyter '12, Christopher Marchbanks '13, Stuart Vance '13, Eric DePinto '13 Front row: Graham Smith '13, Danielle (Honas) Smith '15, Clair Bergeson '12, Caitlin Kodweis '13, MS '16, Alexandra Hall '12, Matthew McGavin '13, Barbara Fletcher '12, Jennifer Buechler '13, Julia (Davis) Ferguson '12, Penny Rogers '12.

BABIES



A NEW LEARNER

Thorn Svendsen '11 and Chelsey (Fedel) Svendsen '12 welcomed Xavier Thorn into the world on April 4, 2017. He has had bright blue eyes and three inches of dark black hair since he was born. Xavier is quickly learning the ways of acoustics, paleontology and how to roll over three times in a row. The couple looks forward to introducing him to the Mines community.



BABY MAKES THREE

Jamie (Berghorn) Dineen '11 and Charles Dineen welcomed their first child, Katherine Grace, on June 9, 2017.



EXPANDING THE FAMILY

Kyra Long '06 and Eric Long welcomed their daughter, Ivy Aria, on April 27, 2016.

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

JOHN W. “BILL” CARLSON II '64 died June 12, 2017. Bill graduated from Mines in 1964 with a degree in metallurgy and served in the U.S. Army during the Vietnam War. He later served as a reserve officer at the Pueblo Chemical Depot Army Base and eventually retired from the military as a major. Over the course of his career, Bill worked for U.S. Steel, Denver Equipment Co., OSNA Electronics, Humphrey Products Company, Lyntek Inc. and Joy Manufacturing Co. Bill traveled the world throughout his career, visiting 64 countries as a mineral processing engineer. He retired in 2002.



WILTON E. “BILL” ECKLEY died Aug. 14, 2017. Bill was born in 1929 in Alliance, Ohio, and came to Mines in 1984 as the Humanities and Social Studies department head. He held that position until 1991, when the department evolved to become the Liberal Arts and International Studies Division. Bill also served as the principal

tutor for the McBride Honors Program from 1989-1991. Prior to his position at Mines, he was an English professor at Drake University for 19 years, serving as the department chair for fifteen of those years. He held many other visiting teaching positions, including Fulbright appointments at the University of Ljubljana in Slovenia and Saints Cyril and Methodius University of Skopje in the Republic of Macedonia. He was also a visiting professor at Bilkent University in Turkey, was a John Hay Whitney Fellow at Yale University and a National Endowment for the Humanities Fellow at the University of Illinois at Urbana-Champaign and the University of Wisconsin. Bill published numerous articles and several books in his lifetime, including *Rocky Mountains to the World: A History of the Colorado School of Mines*.



JOANN FINK died Aug. 5, 2017. JoAnn came to Mines in 1984 as the administrative assistant for the Center for Wave Phenomena Consortium (CWP) at the center's inception in Mines' Department of Mathematics. She later moved into the position of program assistant when the program expanded and transferred to the Department of Geophysics. An integral part of CWP's development, JoAnn was noted by professors for her organizational skills and attention to detail, as well as her background in law office work. Foremost, she was known for her welcoming and attentive nature, and fondly cared for the international graduate research students involved in CWP. She spoke highly of Mines and the students with whom she interacted even after her retirement.



WELDON G. FROST '52 died July 2, 2017. Born in 1931 in Kane, Pa., Weldon received a state scholarship to attend Mines, receiving his bachelor's degree in geological engineering in 1952. As a student, Weldon was a member of the Tau Beta Pi and Sigma Gamma Epsilon fraternities. After graduation, he worked for Mobil Oil Corporation, starting as a petroleum geologist and retiring as vice president and exploration manager for various Mobil affiliates. Following retirement from Mobil Oil, he worked as a consultant in Turkey, Russia, Romania and the U.S. Along with a business partner, Weldon also formed Rio Muni Exploration Company Ltd., which successfully negotiated and farmed-out a production-sharing contract in Equatorial Guinea. He also formed Front Energy Company. Weldon was a lifetime member of the Mines Alumni Association, the American Association of Petroleum Geologists and the Geological Society of America.



DAVID N. “DAVE” HARRISON '64 died July 19, 2017. Born in 1941 in Clovis, N.M., he graduated from Mines in 1964 with a degree in petroleum refining engineering. Dave spent his career working for Phillips Petroleum Co., Celanese Chemical Corp. and Vulcan Chemical Inc.



EVERETT L. KENWORTHY '49 died April 24, 2017. He was born in 1926 in Kansas City, Mo. Everett served in the United States Army Air Corp., and graduated from Mines in 1949 with a degree in metallurgical engineering. He spent his career working as an engineer in General Electric's aviation division. Everett was instrumental in the sale of jet engines for the C-5A cargo plane to the U.S. military and was able to go on the maiden flight that circumnavigated the globe. He retired from GE after 40 years.



EUGENE H. SKINNER '63 died May 8, 2017. Born in 1930 in Bismarck, N.D., Gene graduated from South Dakota School of Mines in 1953 and was drafted into the U.S. Army. He served in West Germany for two years, and after returning to the U.S., graduated from Mines in 1963 with a degree in petroleum engineering. Gene worked for the U.S. Bureau of Mines for 29 years, retiring in 1994. He worked to establish a lightweight concrete for mine stability and received an award for overseeing the sealing of defunct coal mines in West Virginia. Gene also served as the Regional Alumni Director for South Dakota School of Mines for 20 years.

ALSO REMEMBERED

Oliver G. Hesselgren '40.....July 14, 2016



CHARLES E. "CHARLIE" STOTT, JR. '56 died Aug. 19, 2017. Born in 1933 in El Paso, Texas, Charlie transferred to Mines in 1953 from Texas Western College to pursue his bachelor's degree in mining engineering, which he received in 1956. He worked for Phelps Dodge Corporation as a mine supervisor and engineer in Morenci, Ariz., before pursuing a law degree from University of California, Hastings College of Law. He graduated in 1968 and took a counsel position for AMAX Inc. His career with AMAX took him to Colorado, Arizona, Washington and Connecticut. Charlie led the Mount Tolman Molybdenum Project in Washington from 1979 to 1982 before becoming the general superintendent and then the general manager of the Climax mine near Leadville, Colo., beginning in 1982. With the closing of the Climax mine, he moved to Connecticut, serving as the president of AMAX Alloy Division and the vice president of AMAX, Inc. Charlie returned to Golden in 1986 as the president and CEO of AMAX Gold, Inc. and president of AMAX Mineral Resources. He also acted as president and CEO of Horizon Resources and Gold Capital Corp. from 1990 to 1995. Charlie went on to work as an independent mining consultant and held board positions and chairmanships for several companies, including Western Troy Capital Resources, Brigus Gold Corp., Apollo Gold Corp., Getchell Gold Corp. and Hazen Research Inc. He was also a member of the Mines Board of Trustees from 1988 to 1996.



RICHARD "DICK" WAYMAN '51 died May 24, 2017. Born in 1924 in Brownstown, Ind., Dick attended the Navy V-12 program at Berea College and served in the Pacific Ocean theater of World War II. He left the U.S. Navy as a lieutenant (junior grade) and earned degrees in mathematics and chemistry from Hanover College. He also earned a bachelor's degree in metallurgical engineering from Mines in 1951. Dick spent most of his career in sales for Basic Refractories Inc. and Combustion Engineering.

Compiled and written by **Ashley Spurgeon**

► To submit an obituary for publication in the magazine, visit minesalumni.com/obituaries.

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MINER'S PIC



Photo by Aric Snellstrom

PURSUING A HIGHER ELEVATION

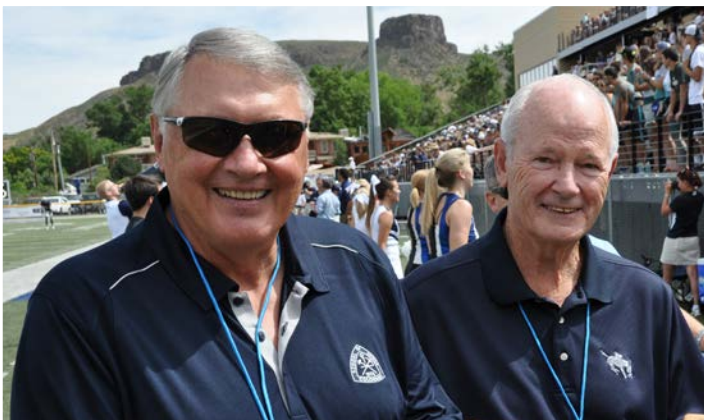
Mines graduate student Ali Smith, who is pursuing her master's in geochemistry, spent this past summer climbing mountains. With her friend, Aric Snellstrom, Smith summited all the 14ers—peaks that rise more than 14,000 feet above sea level—in the lower 48 states.

Her journey began when she climbed her first 14er, Mt. Sherman, during a family vacation to Colorado when she was eight years old. She climbed two others on future vacations, but the challenge of climbing all 53 of Colorado's 14ers—and eventually the remaining 16 in the lower 48 states) began about 4 years ago. Originally from Houston, Smith said she fell in love with the recreational community when she moved to Colorado five years ago. "I realized only a handful of people—fewer than 20—have ever reported completing all these mountains, and if I were to complete them, I would become the youngest reported finisher. This

realization paired with my love for mountains inspired this challenge."

"My favorite part of climbing every mountain is the moment when I approach the summit and realize I am on one of the highest points in the lower 48 states, all under my own power," Smith said. "I expected many of the 14ers to blend together—especially in Colorado since so many are so close together—but each one offers a different perspective and provides a different challenge. Because of this, I distinctly remember each and every mountain, and all the details from each trip. These memories will be something I will always appreciate."

The photo above shows Smith crossing a crevasse on Mt. Rainier in Washington.



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TUESDAY, FEBRUARY 13TH



**Don't miss out on this huge event where companies can interact with
over 2000 students, graduates, and alumni.**

Registration opens Tuesday, October 17th
careers.mines.edu

For more info contact Jean Manning-Clark at 303-273-3239 or jeanmann@mines.edu