

Q&A with President Scoggins

Laser precision redefined

Studio Biology

Fall/Winter 2013 Volume 103 Number 3

Mines

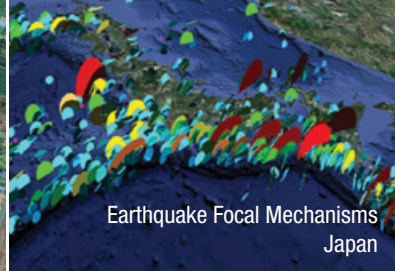
Colorado School of Mines Magazine

Mines Rising

*Transforming Lives campaign
elevates, enriches*



USGS Hydrostratigraphy Sections
Miami, Florida



Earthquake Focal Mechanisms
Japan



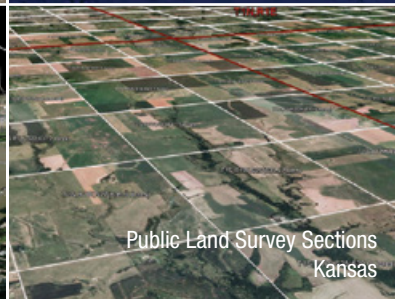
Walkkill Watershed
New Jersey



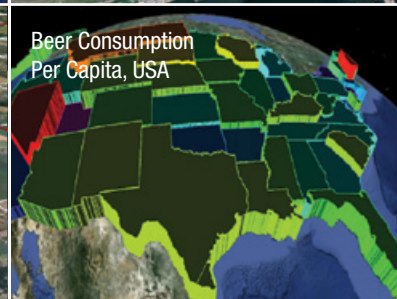
Tornado Path and Magnitude
Midcontinent, USA



Wind Turbines
London, England



Public Land Survey Sections
Kansas



Beer Consumption
Per Capita, USA



Foliation Orientations
Talc Mind, SW Texas



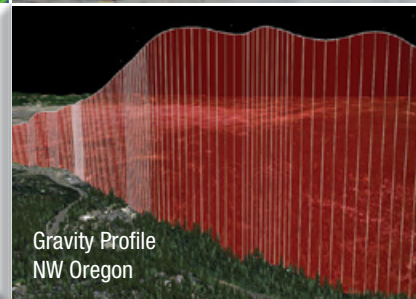
Salt Diapirs
Zagros Mtns, Iran



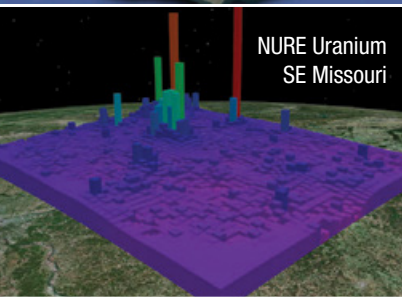
**RockWorks16
EarthApps**

FREE

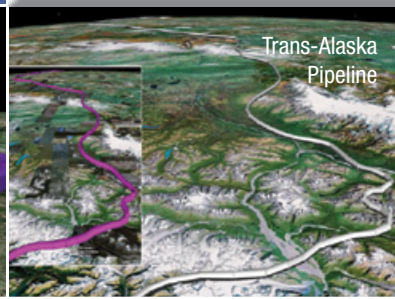
The RockWorks16 EarthApps is a **FREE** collection of over 70 programs for plotting your data within Google Earth. It does **NOT** require any other software (other than Google Earth). It's **FREE**. Really.



Gravity Profile
NW Oregon



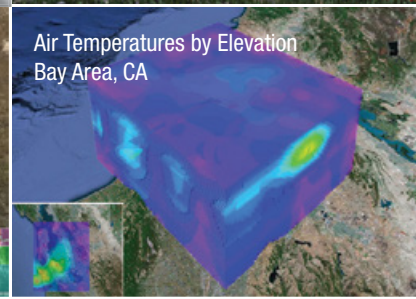
NURE Uranium
SE Missouri



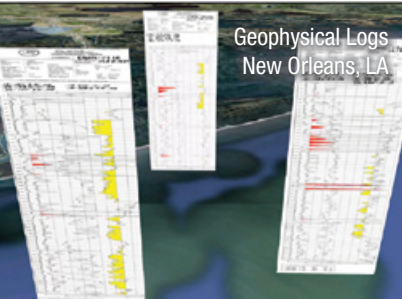
Trans-Alaska
Pipeline



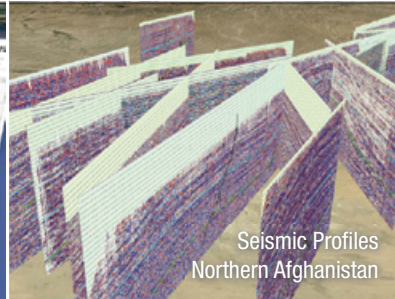
Oil Leases
NW Colorado



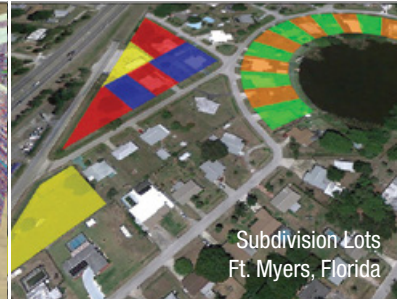
Air Temperatures by Elevation
Bay Area, CA



Geophysical Logs
New Orleans, LA



Seismic Profiles
Northern Afghanistan



Subdivision Lots
Ft. Myers, Florida



Mining Claims
W. Washington



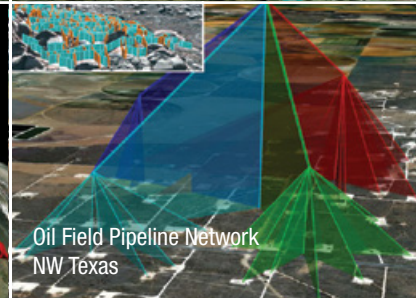
Proportional Zn Geochemistry
NE Arkansas



Weather Forecast
Siberia, Russia



Flight Paths
Persian Gulf



Oil Field Pipeline Network
NW Texas



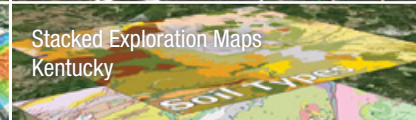
Proposed Pipeline
N. Arizona



Lead Geochemistry
SE Missouri



Contaminant Plume
Washington, DC



Stacked Exploration Maps
Kentucky

CONTENTS

FALL/WINTER 2013

FEATURES

16 Realizing a Vision

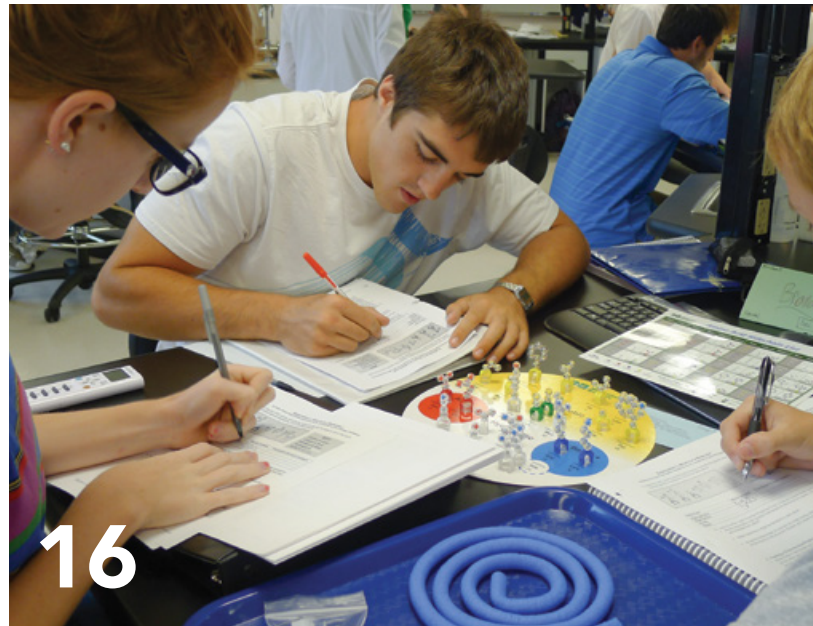
Mines' architectural landscape has radically changed in recent years. While the \$350 million *Transforming Lives* campaign continues the trend, its primary focus is on the human landscape.

20 The Road Ahead: An Interview with President M.W. Scoggins

The university's top administrator reflects on seven years at Mines, most meaningful moments, building through a recession, pressing priorities and more.

24 A Laser's Edge

From Lasik surgery to understanding a fly's brain, Professor Jeff Squier's research at Mines is finding ultra-precise applications for femtosecond lasers.



DEPARTMENTS

4 Inbox

6 Editor's Take

8 Inside Mines

Studio Biology | New Student Stats | First Endowed Department Head | Just Published | Graduate Tunneling Program | Coast Guard Grads

28 Alumni Network

Homecoming | CSMAA Scholarship Recipients

30 Class Notes

Alumni Photos & Updates
Profile: Jennifer Labs '97, MS '01, PhD '04







43 In Memoriam

48 At Your Service

50 Miner's Pic



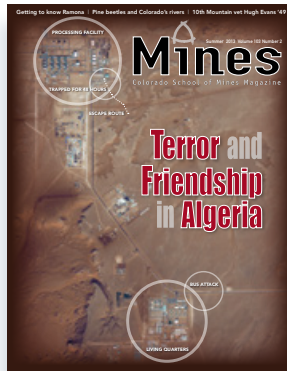
WEB EXTRAS | MULTIMEDIA minesmagazine.com

-  **New faculty** Meet Mines' newest professors
-  **Top honors** ROTC student Matthew Mischo receives Legion of Valor Bronze Cross Award and leadership honor
-  **Transforming Lives** See what philanthropy has done, and can do, for Mines
-  **M Climb** Photos from this year's journey up Lookout Mountain
-  **In Brief** Electron microscope atom probe boosts energy research | Priscilla Nelson named new mining department head | Kirstin Volpi returns
-  **Homecoming** Check out photos of students, alumni and administrators enjoying a field day in celebration of this annual tradition

Icons indicate additional online content



Cover photo: Tyson Brown '08, MS '11



RAMONA GRAVES PROFILE

Great article about Ramona! I'm glad she was there to help educate my son (Gary Nilson Jr. '08) and especially my daughter (Jessica Nilson '13), who recently started a job for Newpek and is doing well, thanks to her Mines training.

Gary Nilson '76

In "The Face of Petroleum Engineering," [summer 2013], Ramona Graves' comments about the Division of Liberal Arts and International Studies struck a deep cord of disappointment. As a proud alumnus of the Petroleum Engineering Department who took full advantage of the educational, artistic and enrichment opportunities provided by LAIS, I felt her answer didn't do justice to the important contribution the division makes to the Mines campus. I can say without hesitation that the skills I acquired from LAIS courses make me a more complete engineer. My technical petroleum engineering courses taught me to draw the dots; the courses I took through LAIS help me connect them.

Engineering decisions are not always strictly technical; there is an "art" to drill-

ing a well, a "finesse" to interpreting logs, a "knack" to solving

mathematical problems. I'm proud of my degree and grateful for all that Dr. Graves and others have done to strengthen the Petroleum Engineering Department. I'm also deeply grateful to LAIS faculty for helping me develop skills essential to applying my technical knowledge, and for providing opportunities for artistic, intellectual and cultural enrichment.

Abdullah "Sami" Yahya '11

PRECIOUS RESOURCE

I am so pleased to read about Mines' growing efforts in the area of water resources ["Modeling a Beetle's Impact on Water Systems," summer 2013]. This emphasis seems to have emerged in the last decade and already the school is recognized as being among the leading institutions in the field, just as it has earned a reputation for being among the best in the world in other fields. Onward and upward!

John Mueller '84

SHARED TRAGEDY

[Response to "Terror and Friendship in Algeria," summer 2013] I work for a company called Englobal. A man named Victor Lovelady, who was a longtime employee of Englobal, quit to work at this gas plant just months before the attack. We received an email from Englobal management [during the attack] alerting us to what was going on, and we prayed for all the foreign workers' safety for those three days. We were saddened to find out that Victor was one of the dead. I'm glad to read this story about three Miners who survived.

Laurie Flanigan '87

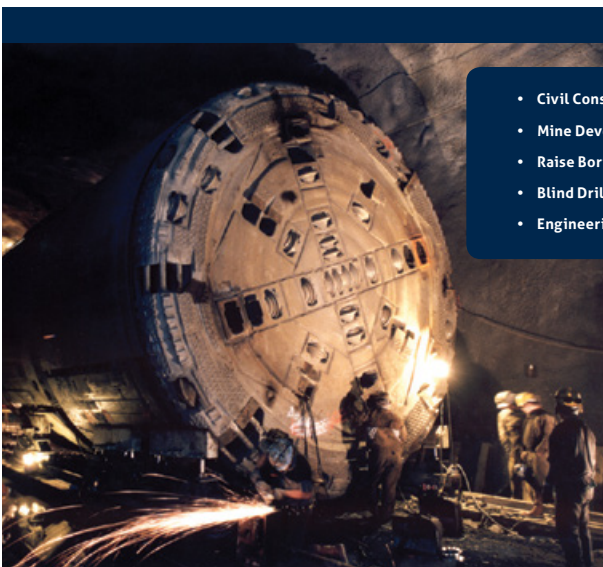
CORRECTIONS

In the Alumni Network article describing the event, "Securing Your Next Move," published in the spring 2013 issue, we incorrectly described panelist Leslie O'Connor as a recruiter. "Seasoned energy industry executive and former president of MHA Petroleum Consultants" would have been more accurate.

We reported in the summer 2013 issue that The Ramona M. Graves Endowed Scholarship Fund mentioned in "The Face of Petroleum Engineering" was established by alumni from the classes of 1989-1994. In fact, two members of the class of 1982 and one member of the class of 2013 also contributed.

In the sidebar to the profile on Hugh Evans '49 ("A Mines Fascination," summer 2013, p. 34), we omitted one of Evans' three alumni grandsons—Timothy Clem '04.

Mines regrets these errors.



- Civil Construction
- Mine Development
- Raise Boring
- Blind Drilling
- Engineering Services
- Hoisting Systems
- Vertical Belt Systems
- Elevator Systems
- Brakeman Cars
- Field Services

Innovative solutions for the underground mining industry.

Frontier-Kemper provides a wide range of construction services and related manufactured products. We build tunnels for highways, railroads, subways and rapid transit systems. We construct tunnels, shafts, and other facilities for water supply and wastewater transport. We develop and equip underground mines for coal, salt, copper, and other minerals. Our FK-Lake Shore Division designs and installs innovative hoisting, elevator, and vertical conveyance systems. Simply put, we are builders, and our goal is to be the industry's best source – and best value – for complete turn-key construction services and products.

PO Box 6690
Evansville, IN 47719
1.877.554.8600
www.frontierkemper.com
information@frontierkemper.com



**FRONTIER-KEMPER
CONSTRUCTORS, INC.**
A Tutor Perini Company



**MAKE THE
MOST OF AN
EDUCATION
THAT WORKS**

RENEW YOUR MEMBERSHIP IN THE CSM ALUMNI ASSOCIATION

- **STAY CONNECTED** to the Mines community—on campus, in your own backyard and around the world.
- **GAIN ACCESS** to powerful networking tools.
- **SHOW YOUR MINES PRIDE.**
- **ENJOY** a new membership benefit.

REKINDLE YOUR MINES CONNECTION
VISIT minesalumni.com/membership



ALUMNI ASSOCIATION
COLORADO SCHOOL OF MINES

An Inspired, and Inspiring, Community



With 2013 almost at an end, I hope you can look back on a happy and successful year. As reported in this issue, the Colorado School of Mines community certainly has a lot to celebrate: After receiving a record number of applications, Mines welcomed its most academically accomplished class on record in August (see p. 9), research funding and private giving both broke records for the second year in a row, a major new residential and dining facility is under construction, and a new capital campaign has been launched, which includes ambitious plans for infrastructure development, and faculty and student support.

Mines is rising on many fronts, and reading our Q&A with President Scoggins (p. 20) and “Realizing a Vision” (p. 16) will help outline these trends and the university’s strategic direction.

I also recommend the feature, “A Laser’s Edge,” which focuses on the remarkable work of Jeff Squier ’84, MS ’86. A physics professor at Mines who holds one of the original patents for Lasik surgery, Squier recently developed a new approach to laser surgery that is far more precise and safer than the technology currently in use. At the same time, he’s providing neuroscientists with 4D imagery of working brain cells, and is helping to develop microscopic diagnostic tools for medicine. It’s inspiring science led by an inspiring individual.

On the subject of inspiring individuals, the alumni association says farewell to Serena Stickney Bruzgo at the end of 2013. Since joining CSMAA in 2006, Serena’s service to the organization and the school has been tireless. With enthusiasm, intelligence and warmth, she’s expanded existing programs and developed new ones, grown CSMAA membership, helped launch an online community, and, in many creative ways, animated the organization’s presence in the global Mines community. Her perpetually positive outlook has inspired my work and that of my colleagues, particularly while serving as interim executive director during the last nine months—a role she stepped into only two months after returning from maternity leave. I know many share my heartfelt appreciation for her leadership and vision.

I’d also like to say thank you to Will Weiskopf ’13, who graduated this month, having worked for *Mines* for the last three years. Will has made valuable contributions to the magazine, particularly with regard to our electronic presence. His latest is a redesign of minesmagazine.com—check it out and let us know what you think. You can reach us at magazine@mines.edu or by leaving a comment on the website at the end of any of the stories you find there.

Wishing you restful and happy holidays.

Nick Sutcliffe

Editor and Director of Communications
Colorado School of Mines Alumni Association



FALL/WINTER 2013
VOLUME 103 NUMBER 3
minesmagazine.com

President, Colorado School of Mines
M.W. Scoggins

President, CSM Alumni Association
Paul Wareham ’85

Interim Executive Director
CSM Alumni Association
Serena Bruzgo

Editor and Director of Communications
CSM Alumni Association
Nick Sutcliffe

Managing Editor and
Assistant Director of Communications
CSM Alumni Association
Amie Chitwood

Art Director
Craig Korn, VeggieGraphics

Editorial Board
Serena Bruzgo, Amie Chitwood, Tina
Gianquitto, Karen Gilbert, Peter Han, Trisha
Bentz Kendall, John Poate, Matt Showalter ’99,
John Spear MS ’94, PhD ’99, Nick Sutcliffe

Contributing Writers
Larry Borowsky, Carol Chapman, Lisa Marshall,
Doug McPherson, Chris Porto

Copy Editor
Trisha Bentz Kendall

Administrative Support
Ruth Jones, Linda Nothnagel, Jo Marie Reeves,
Nancy Webb, Angie Yearous ’91

Webmaster
William Weiskopf ’13

Printing
American Web
CPM Number # 40065056

Mines is published by Colorado School of Mines and the CSM Alumni Association for alumni and friends of the school. *Mines* is a critical communication serving the Colorado School of Mines community. Its mission is to keep readers informed about the school, to further the goals of the school and the alumni association, and to foster connectedness.

Comments and suggestions are welcome.
Contact us at magazine@mines.edu;
Mines magazine, PO Box 1410, Golden, CO 80402;
or 303.273.3294. Just need to update your address?
Go to minesalumni.com/update.



exceeding
EXPECTATIONS

through capital
EFFICIENCY

and consistent operational
EXECUTION

*That's SandRidge Energy.
That's the Power of **US.***



SANDRIDGE
THE POWER OF US™

ENGINEERING EDUCATION

Changing Biology

Successfully manipulating the DNA of bacteria so they fluoresce under ultraviolet light would have rocked the bioscience community a few decades ago. Today, it's an intriguing, though straightforward, procedure built into an innovative freshman biology course launched this fall at Mines.

During a visit to the laboratory-classroom in October, students were confirming the genetic manipulation had worked. With UV lights and specialized digital cameras trained on petri dishes, their work was plainly visible as constellations of bright dots displayed on numerous workstation computer monitors around the lab.

The Department of Chemical and Biological Engineering's new Studio Biology I course (soon to be complemented by Studio Biology II) takes lessons from the highly successful studio physics courses pioneered by the Department of Physics over the last decade (see summer 2012, p. 8). Studies conducted at Mines and elsewhere demonstrate that, by requiring students to collaborate in groups on carefully structured experiments and activities, outcomes for retention, critical thinking, problem solving, teamwork and initiative are all improved over conventional teaching approaches.

Teaching Associate Professor Judy Schoonmaker, who has played the lead role in creating the studio biology course and in

designing the new lab, explains, "We give students meaningful, real-world problems and ask them to form hypotheses and develop procedures for testing them."

Earlier in the year, students worked with an enzyme that catalyzes the breakdown of hydrogen peroxide into oxygen and water. The goal was to determine how the reaction was impacted by different environmental factors. Students were challenged to design their own experiments, with occasional prompting from Schoonmaker over the lab's PA system. "I just offer ideas. 'What do you suppose happens when you change the concentration of the enzyme—or the pH—or the temperature?'" Schoonmaker explains. "Rather than following instructions by rote from a lab manual, we encourage students to take initiative and share ideas."

With studies of this instructional model suggesting that social interaction is one of the keys to success, the lab is configured so the 21 workstations, which each accommodate three students, are in close proximity to two other workstations, forming a pod of nine. Groups are encouraged to ask questions, share ideas and compare results with their neighbors.

Workstations are equipped with computers, dual monitors, video microscopes, digital cameras, and digital balances, as well as more specialized equipment like micropipettes and oxygen, pH and temperature sensors. "We have an enviable toolbox," says Schoonmaker, whose enthusiasm for the new course is infectious. "They're freshmen and their reaction is, 'We get to work with this?' It's great knowing that after this course they can walk into a research lab and know how to use all this equipment." That said, she admits the course format takes some getting used to. "They've spent the last 13 years being taught to, lectured to—this is a switch."

Tony Dean, a longtime veteran of the Department of Chemical and Biological Engineering who now heads up the College of Applied Science and Engineering, is excited about the potential impact of the new course, both on the department and the rest of campus. "In addition to strengthening chemical and biological engineering programs, we also envision that Studio Biology I and II can pave the way for the creation of new bio minors in other disciplines," says Dean. "Students would take these as foundational prerequisites and then move on to specialized coursework in their own departments."

As Schoonmaker puts it, "If I can demonstrate engineering concepts in the context of biology, such as biomimicry, it becomes much more interesting. This is not a plain biology course—it's a biology course with an engineering backstory."

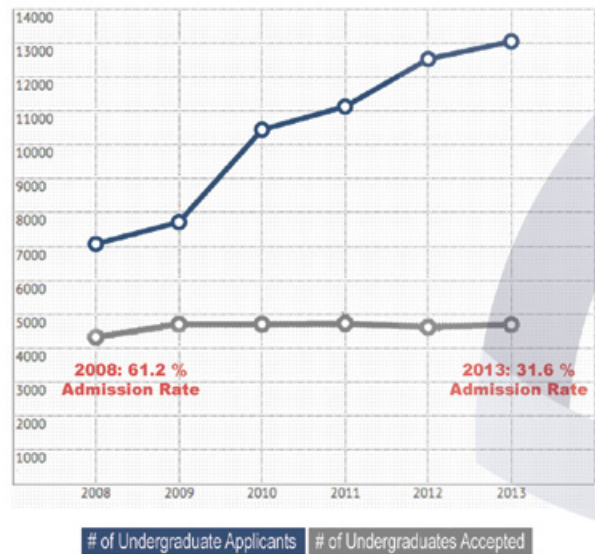


Nick Sandiford

ACTIVE LEARNING The experiential emphasis of the Department of Chemical and Biological Engineering's new Studio Biology I course is modeled after some highly successful foundational courses developed by Mines' physics department.

ADMISSIONS

Mines' 2013 Incoming Class



3.8
average
HS GPA*

*Unweighted

1326
average
SAT

Average SAT in
2008: 1253

30
average
ACT

28.2% Female

19.1%

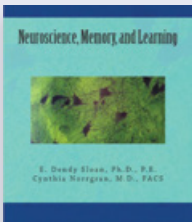
Underrepresented Ethnic & Racial Students

Male Female

“...our most academically prepared undergraduate class to date.” —President M.W. Scoggins

BOOKS

Just Published



Neuroscience, Memory, and Learning

Professor Emeritus E. Dendy Sloan Jr. and Cynthia Norrgran, a teaching associate professor at Mines and a neurosurgeon, both of the Department of Chemical and Biological Engineering, coauthored this book intended to answer the question, “How does the brain create, access and use long-term memory?” The text aims for a balance between neuroscience and learning theory, and was written for use in their own neuroscience course at Mines. Michal Schafer '13, Norrgran's son, illustrated the book. (CreateSpace Independent Publishing Platform, 2013)

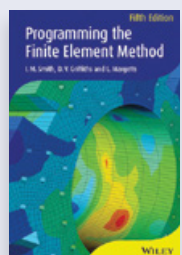
Professor Vaughan Griffiths, contains new and upgraded programs and theory relating to plasticity, thermal analysis and fluid flow, in addition to a radically upgraded chapter on parallel algorithms for finite element analysis. The text has been in print since the mid-1980s and is one of the most successful finite element texts in engineering literature. (Wiley, 2013)



Too Hot to Touch: The Problem of High-Level Nuclear Waste

William Alley '74 and his wife, Rosemarie, outline the controversies

and possibilities surrounding disposal of nuclear waste in their new book. It provides a full history from immediately following World War II up to the present day, with perspectives drawn from William's experience, including leading the U.S. Geological Survey studies of Nevada's Yucca Mountain Nuclear Waste Repository from 2002 to 2010. (Cambridge University Press, 2013)



Programming the Finite Element Method

The 5th edition of this text, co-authored by Civil and Environmental Engineering



FIRST ENDOWED DEPARTMENT HEAD

Thanks to a \$3.5 million gift from Cimarex Energy, Mines has established the F.H. “Mick” Merelli/Cimarex Energy Distinguished Department Head Chair in Petroleum Engineering—the first of its kind at Mines. It was unveiled on September 17 in a ceremony attended by Tom Jordan '80, MS '87, chairman, CEO and president of Cimarex Energy. Speaking about the company's former CEO, F.H. Merelli '59, Jordan says, “Mick had an unbelievable ability to recognize talent in others. He would handpick people and find that spark of ability in them, give them responsibility and challenge them to do things that they didn't think they could do. He was as good a mentor as I've ever seen.” A search to fill the endowed chair is under way.

CIVIL ENGINEERING

New Underground Construction and Tunneling Program Prepares Students for a Growing Industry

This past summer, the world's largest-diameter tunneling machine, "Bertha," went into action digging a tunnel beneath downtown Seattle to replace the Alaskan Way Viaduct, which was damaged in a 2001 earthquake. The double-decker waterfront highway, built more than half a century ago, carries approximately 110,000 vehicles a day.

Mike Mooney, a professor in the Department of Civil and Environmental Engineering and the director of the Center of Excellence in Underground Construction and Tunneling at Mines, summarizes the unique engineering challenge the Seattle project presents: "It's a 58-foot-diameter tunnel going under 170 buildings in downtown Seattle, and the allowable settlement for any one of these buildings is on the order of half an inch." That isn't much room for error.

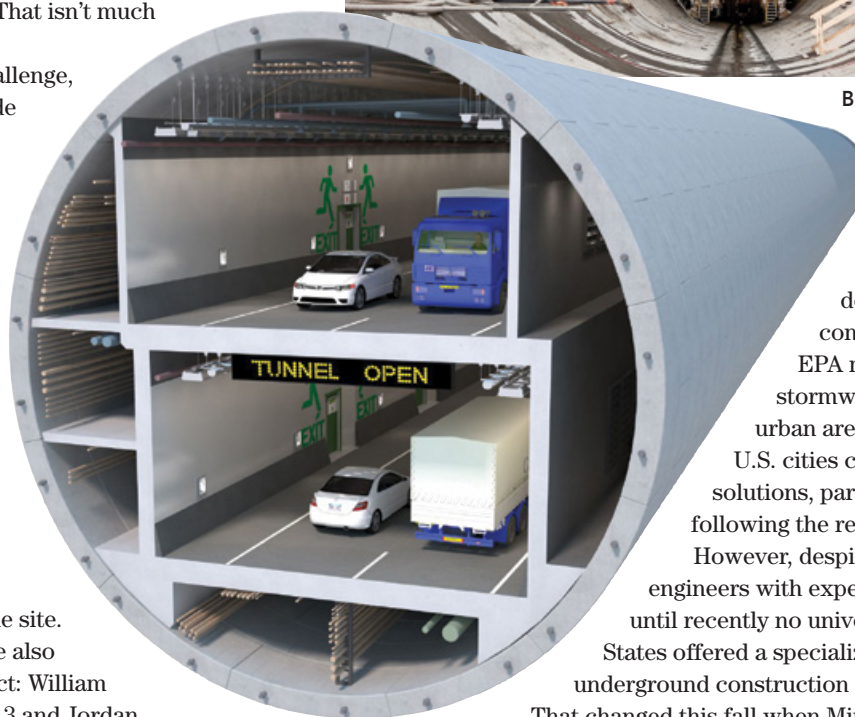
Helping meet the challenge, Mooney's students made contributions to the design of the Seattle tunnel as part of their project design course. "They got to design components of the largest bored tunnel in the world," says Mooney, who expected to return to tour the project in December with 19 students, including Kamyar Mosavat, who's conducting his graduate research at the site. Three Mines alumni are also connected to the project: William Hodder '10, Sean Leo '13 and Jordan Ter Har '07.

Demand is rapidly on the rise from the underground construction and tunneling industry for engineers with the skills to tackle these types of projects. When KPMG issued its Top-100 infrastructure projects report last year, more than 10 percent of them involved major tunneling. Continued urbanization accounts for some of the demand. "The only place big cities can go now is underground," Mooney says. Recently, New York City began work on a large underground rail hub 16 stories below Grand Central Station. The new terminal will allow transportation to and from the west and east sides of Manhattan.



Washington State Department of Transportation

Bertha, the world's largest tunnel boring machine, is digging a tunnel to replace the Alaskan Way Viaduct in Seattle.

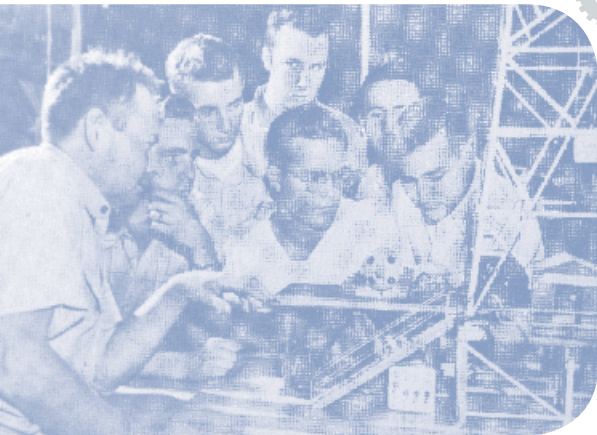


Another factor driving demand is the need for compliance with a major EPA mandate regarding stormwater management in urban areas that has many major U.S. cities considering tunneling solutions, particularly in Colorado following the recent devastating floods. However, despite the clear need for engineers with expertise in this area, until recently no university in the United States offered a specialized graduate degree in underground construction and tunneling (UC&T).

That changed this fall when Mines became the first university in North America to offer an interdisciplinary graduate program specializing in the field. Mines' UC&T program features integrated coursework from civil, geology and mining classes, as well as opportunities for industry experience—which, these days, is not hard to arrange. "The industry relies on internships by our students. It's the way they interview them," Mooney explains.

Mooney was recently appointed Grewcock University Endowed Chair in UC&T. The chair was established in 2012 through a generous donation from Bruce E. Grewcock '76, chairman and CEO of Kiewit.

—Carol Chapman and Chris Porto



**INVESTING IN PEOPLE AND IDEAS TO
ENGINEER A VIBRANT GLOBAL FUTURE**



TRANSFORMING LIVES

The Campaign for Colorado School of Mines

As global population soars and demand for resources, energy and technology climbs to unprecedented levels, the profound challenges facing our world require smart solutions. The world needs Mines, and with the most ambitious campaign in university history, we are ensuring our ability to heed the call.

giving.mines.edu



**COLORADO SCHOOL OF MINES
FOUNDATION**

ENGINEERING AND TECHNOLOGY MANAGEMENT

Coast Guard Officers Find Unlikely Fit

Going inland to a landlocked state to earn a graduate degree seems like an odd choice for members of the U.S. Coast Guard, but the program's alumni report they take valuable skills back into the service.

For Tony Hahn MS '04, the idea of heading to the mountains for a graduate degree dates back 10 years. He was moving through the ranks of the Coast Guard, had graduated from its flight school and was an aeronautical engineering officer. To continue his professional ascent, he applied and was selected for the Coast Guard's avionics/project management advanced education program, and began researching master's degrees that the Coast Guard would approve.

His search led him to the Engineering and Technology Management program in Mines' Division of Economics and Business. Hahn had spent his freshman year at Mines



Ed Aponte MS '13 (left) and Benjamin Norris MS '13, who graduated from Mines' ETM program in December, are both officers and pilots in the U.S. Coast Guard.

Tyson Brown '08, MS '11

(1985–1986), but joined the Coast Guard in 1986 to pursue his passion for flying helicopters.

"I pitched ETM to my program manager and he was puzzled. 'Where? Colorado School of what?' he said. But after he read more, he approved it," says Hahn. "He was impressed by the quality and reputation, and it certainly didn't hurt that active-duty military pay in-state tuition rates."

Hahn fell in love with ETM. "I can easily say Mines was the best intellectual experience of my life. I

still use the analysis tools and decision framework I learned," he says. "The ETM program taught me how to be successful. It wasn't easy, but from day one, my professors made the material relevant to real-world examples that captured my intellectual curiosity."

Not long after Hahn left Mines, he became deputy chief of aeronautical engineering for the Coast Guard, managing

(continued)

SHERIDAN ROSS attorneys at innovation
pc

patent / trademark / copyright

sharing your commitment to innovation.



STANDING, LEFT TO RIGHT

Stanley Gradisar Patent Attorney, Of Counsel
B.S., Mining Engineering, 1974

Matthew Ellsworth Patent Attorney, Shareholder
B.S., Engineering, with honors, 2003,
M.S., Engineering Technology Management, 2005
Top Graduating Electrical Engineer

Brad Knepper Patent Attorney, Shareholder
B.S., Electrical Engineering, 1998

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

SEATED

Doug Swartz Patent Attorney, Shareholder
B.S., Mining Engineering, Minor in Metallurgical
Engineering, 1982

Kristen Gruber Patent Attorney, Associate
B.S., Chemical and Petroleum Refining
Engineering, 2000

Protecting bright CSM ideas for more than 25 years.

Denver / Colorado Springs / Broomfield 303.863.9700 / www.sheridanross.com





**EVERYTHING WE USE IS THE
BEST OF ITS KIND.
UNTIL WE DESIGN
BETTER.**

Join a team with the technology to take on big challenges, the integrity to do it responsibly, and the drive to keep the world moving forward. Are you up to the job?

We're Hiring Experienced Professionals

Chevron is hiring experienced technical professionals for positions in:

- Drilling
- Completions
- Mechanical Engineering
- Chemical Engineering
- Electrical Engineering
- Civil Engineering
- Subsea Engineering
- Petroleum Engineering
- Earth Science

To learn more about our positions and to apply, visit us online at chevron.com/careers

**JOIN THE
CHALLENGE.**



Human Energy®

**TRANSFORM LIVES.
BUILD THE FUTURE.**



Make a gift to the future by supporting Mines with a bequest, charitable trust, or other tax-wise gift plan. You'll be advancing innovative education and research that transform lives on campus and around the world.

Discover more details by contacting:

Chris Wenger
Senior Director, Gift Planning
303.273.3275
cwenger@mines.edu
giving.mines.edu/giftplanning



INSIDEMINES

Coast Guard (continued)

graduate school requests. "After my experience, I encouraged grad school applicants to consider applying there. Without exception, every officer has excelled and had a great experience. We see a proven product that provides critical thinking and excellent project management skills," he adds. "We learn new ways to analyze decisions and provide our senior leadership with sound, data-driven recommendations. Because of the environment in which we work, we have to manage uncertainty, making defensible decisions aimed at optimizing outcomes."

To date, the U.S. Coast Guard has seven alumni of the ETM program. In addition to Hahn, they include Tim Barelli MS '09, Pat Lineberry MS '11, Brian Kostecki MS '12, Brian Willson MS '12, and two December graduates, Ed Aponte '13 and Benjamin Norris '13.

After chasing drug runners in high-speed boats on the Caribbean, plucking climbers off California cliffs, and hoisting the sick and injured from boats pitching violently in rough seas off the coast of Alaska, Aponte and Norris admit the Mines graduate program has been a big change.

"I'm glad I came to Mines. Everything I'm learning—best business practices,

operations research and decision making—will translate directly into my next job," says Norris, who has been flying helicopters for eight years and describes his time spent commanding a crew and helicopter in the Bering Sea as "the most rewarding and exciting tour of my career."

Aponte, an aircraft commander who oversees crews, mission execution and helicopter mechanics, chose Mines over George Washington University and Johns Hopkins. "There was no debate, and I've never looked back," he says.

After graduation, they were both assigned to Elizabeth City, N.C. They are excited about their new jobs and the new opportunities that await them, but having lived close to campus for the past year, they are not looking forward to their new commute: They plan to move their families to the Norfolk, Va., area to have more schooling options, which will mean a 1-hour commute each way. The last time we spoke, they were still working on a solution to this problem—the best one they'd come up with was sharing the cost of a small plane and flying to work. "We'll be working next to a runway," Aponte says, a twinkle in his eye.

— Doug McPherson



Thin Air Images, LLC

ONE LAST TIME IN 2013 In honor of Senior Day and what might possibly have been the final football game to be viewed from the 91-year-old grandstands at Campbell Field, the Orediggers soundly defeated the Chadron State Eagles 23-0 on Saturday, November 16, finishing the season with an 8-3 record. It was the first time Chadron State had been shut out in 11 seasons.



For more on Mines athletics, visit csmorediggers.com.

IN BRIEF

Looking for In Brief? Get the scoop on faculty awards, new hires and more at minesmagazine.com/InBrief.

BRIGHTEN UP YOUR HOLIDAYS
GET **50% OFF**

DUAL KITS | SPORT POLARIZED | PRO RACING KITS | POLARIZED SPORT READERS



Model: France2

FULLY RX-ABLE • LIFETIME GUARANTEE • FREE SHIPPING

XX2i
OPTICS

www.XX2i.com

enter promo code: XX5XG5



Realizing a Vision

What \$350 million can do for Mines

By Lisa Marshall

From his third-floor office window in the historic Guggenheim Hall at the center of campus, President M.W. Scoggins can see the future:

To the south, prospective students and visiting alumni will be greeted at a sleek new Welcome Center. To the east, a state-of-the-art academic and research building will offer future physicists and engineers new labs and classrooms. To the north, at a new athletics complex, students, faculty and alumni will come together to cheer the Orediggers to victory. On evenings and weekends, the university will bustle with life, with more students living on campus than ever before, expanded recreational programs, and more diverse cultural and intellectual opportunities to complement Mines' highly technical curriculum.

And thanks to a robust financial aid program, funded in part by grateful alumni paying it forward, the student body will be known for being academically—not necessarily economically—elite.

"I like simple visions," says Scoggins, who came to Mines in 2006 after spending 35 years with Mobil and ExxonMobil. "Our vision is to transform Mines into a globally recognized top-tier research university, and we're well on our way to achieving that goal."

MEETING A GLOBAL NEED

To help realize this vision, Mines launched the *Transforming Lives* campaign in September, aimed at raising \$350 million in private philanthropic and nongovernmental research support. Priorities include student scholarships, faculty positions, enrichment and outreach initiatives, K-12 and international partnerships, and several capital projects.

Along with the monetary goal, the campaign also has a less tangible objective: to broaden the school's circle of support by cultivating a lasting culture of philanthropy. "We want to permanently expand the world of donors who are interested in helping Mines," says Scoggins.

In an age of dwindling state funds, private support is more critical than ever; while undergraduate enrollment at Mines has increased 24 percent over the last five years, state funding per resident undergraduate student has declined 34 percent.

To offset the loss in revenue, Mines has had to increasingly rely on tuition and fees, which in turn has put more pressure on financial aid resources as the university seeks to make good on its commitment that all qualified students will be able to attend Mines, regardless of their ability to pay.

Funding for capital projects has been similarly hit. "It wasn't too long ago that states were providing two-thirds of the funding for public higher education, and parents and students paid the other third. That has more than flip-flopped," says Scoggins.

In his meetings with potential donors, Brian Winkelbauer, executive vice president for university advancement, often discusses the big-picture reasons to support Mines, which apply to a broader audience than the student and alumni communities.

"The world needs Mines," he says. "Global population is expected to reach 9 billion over the next 40 years. That kind of growth results in some pretty profound global challenges, including increasing demand for energy, water and natural resources. These are the kinds of challenges that Mines has been addressing for decades."

PROGRESS THROUGH PHILANTHROPY

Alumni say that private support has already played a role in transforming Mines into a residential campus, which now includes new and refurbished housing, an outstanding recreation center, a new health center, a new Center for Academic Services and Advising, and more than 170 campus organizations.

"When I went to Mines, it was survival of the fittest. They didn't have nearly the same services or facilities available to students," recalls trustee and campaign co-chair Tim Haddon '70, who came to Mines in 1966 from Rhodesia, thanks to a generous grant from the Hochschild Family, of AMAX Mines. "Today it is tough to get in, but if you do, we will do everything we can to help you graduate and succeed."

For senior Alex Steadman, help came in the form of a



SUPPORTED LEARNING Student scholarships are a key focus of the *Transforming Lives* campaign.

generous financial aid package from the start, as well as a boost from a departmental scholarship fund and the Dean Burger Memorial Endowment Fund when things got tough.

"I wouldn't be here without financial aid," says Steadman, who graduated from Estes Park High School in 2010 at a time when his parents, already hit hard by the financial downturn, suffered more financial and emotional setbacks when the 2012 High Park Fire swept through his family's property.

For 27-year-old Brianna Svoboda, who started graduate work at Mines in 2011, help came in the form of a grant from the Dean Burger Memorial Endowment Fund, which allowed her to engage more fully in campus life. "Before, I had three jobs, and I didn't really have the time to participate," says Svoboda, who is now president of the student chapter of the Association of Environmental and Engineering Geologists. "These clubs are a really important part of your campus experience ... I am very appreciative of the helping hand, and I intend to give back some day."

If she's like many Mines grads, being in a position to give back might not take too long. In Payscale's 2014 College Salary Report covering almost 1,500 national colleges, Mines ranks sixth for first-year salaries, and sixth for 30-year return on investment, which factors in average 30-year earnings for graduates, along with the cost of attending the university.

LOOKING AHEAD

The *Transforming Lives* campaign is off to a strong start. Mines has seen record levels of giving during the campaign's silent phase, which typically precedes a public launch. The record of \$32.5 million set in 2012 for private gifts and commitments given during the fiscal year was broken in 2013, which saw \$35.4 million in giving. To date, alumni, friends, foundations and corporate partners have given nearly \$166 million to the campaign, including more than \$104 million in private philanthropic support.

"With this campaign, we are achieving a much broader reach, particularly internationally," says Haddon. "Every donor has a

“ Mines' small size makes interdisciplinary collaboration easier, but we want to magnify this dynamic in these rapidly evolving fields. ”



BIG ANNOUNCEMENT At Mines' Evening of Excellence, the campaign launch event on September 27, 2013, President Scoggins (left) framed a vision for the \$350 million initiative, along with (left to right) David J. Wagner, president and chair of the Colorado School of Mines Foundation's Board of Governors, and campaign co-chairs Charles E. Shultz '61 and Tim Haddon '70.

passion, and we are working to match Mines programs to fit those passions."

Winkelbauer adds that broad participation is an important objective for the campaign. "Everyone's gift is valued. Everyone can be a part of this. Our goals are about meeting the needs of Mines through the involvement of all donors." These donors, he points out, include students, who sometimes start giving to Mines before they even graduate.

The number one priority for campaign organizers is to boost financial aid resources, which now benefit more than 80 percent of students. Another key priority is to create new student programming. "We have made great progress with physical infrastructure, and we have developed some exciting new programs, but there are many promising initiatives that need enhancing or are not off the ground yet," says Dan Fox, vice president for student life. He envisions more external speakers on campus,

weekend leadership workshops, and expanding Theme Learning Communities, which group freshmen in dorms based on their interests.

Another high priority for the campaign is establishing new faculty chairs—positions that often come with higher salaries, discretionary research budgets and added prestige. "To recruit the best and brightest students, we need to recruit the best and brightest faculty," says Winkelbauer. "Endowed positions can help achieve this." Campaign gifts totaling \$14.5 million have already created seven new named faculty positions, which brings the total number of named faculty chairs and professorships established at Mines to 33. Of Mines' 14 academic departments and divisions, only three have yet to receive an endowed chair.

Several capital construction projects are among the campaign goals, including construction of the Clear Creek Athletics Complex that will include training facilities, sports medicine, office and event space, locker rooms, a new soccer field, and—in honor of the former coach and athletics director, professor emeritus and 1963 alumnus—the new Marv Kay Stadium. Winkelbauer reports that fundraising is progressing well for the project, which will be entirely funded with private donations.

A cornerstone academic and research building is another high priority. Situated in the heart of campus, it will add much-needed instructional and lab space for the physics department, while establishing a hub for interdisciplinary collaboration within the recently formed College of Applied Science and Engineering. "Particularly in the areas of materials and bio, we are trying to group faculty and students from our four departments based on their areas of research, instead of their academic disciplines," explains Tony Dean, who heads up CASE. The arrangement will make it easier to share resources and equipment, but the real goal is to promote the exchange of ideas. "As researchers with

A Public Institution, Shaped by Private Giving

Dating back more than a century, a legacy of philanthropy has profoundly impacted Colorado School of Mines' evolution.



1904 Stratton Hall is built with Mines' first major philanthropic gift: \$25,000 from mining mogul Winfield Scott Stratton, a trustee and former student.

1905 Guggenheim Hall is constructed with a gift of \$80,000 from philanthropist Simon Guggenheim.

1971 The Cecil H. and Ida Green Graduate and Professional Center is built with a substantial gift from the Greens.

1976 George R. Brown Hall is built with a \$4.4 million gift from George Brown '22, donated through his Houston-based foundation. The gift is instrumental in establishing the Division of Engineering.



1978 The McBride Honors Program in Public Affairs is established, thanks to the work of dedicated faculty and private financial support.

1989 The Multicultural Engineering Program is launched with a multi-year commitment from ARCO Foundation.

1992 Three endowed chairs in the Division of Engineering are established thanks to a \$6 million gift from the Brown Foundation.




1995 The Women in Science Engineering and Mathematics program is established with a gift of \$150,000 from Chevron.

2003 The Chesebro' Distinguished Chair in Petroleum Engineering is established with gifts totaling \$2.5 million from Steve '64 and Dollie Chesebro'. It is the department's first endowed faculty position.

diverse backgrounds become familiar with each other's work, novel ideas and insights will emerge," says Dean. "As it is, Mines' small size makes interdisciplinary collaboration easier, but we want to magnify this dynamic in these rapidly evolving fields. It's a concept with tremendous potential," he adds. (CASE is made up of the departments of Chemical and Biological Engineering, Chemistry and Geochemistry, Metallurgical and Materials Engineering, and Physics.)

A parallel approach has guided planning for the Welcome Center, a new facility to be built west of Illinois between 18th and 19th streets, which will house several outwardly focused campus offices, including admissions, the foundation, the alumni association and public relations. Proximity will encourage collaboration and information exchange, Winkelbauer believes, making the center the primary conduit for communicating information about the university to external audiences. "It'll amplify our message," he says. At the same time, it will provide a gathering place for visiting alumni, industry partners, and prospective students visiting with their families. "For the first time, Mines will have a formal gateway," says Winkelbauer.

Amping up Mines' marketing efforts to reach a wider audience will be welcomed by many who are familiar with the university's capabilities and accomplishments, yet still see unrealized potential.

"With our focus on the areas of earth, energy and environment, this university is probably the best-positioned of any to tackle the global issues of our time," says Scoggins. "This represents an opportunity and a challenge—one we have committed to take on. Success will be determined to a large extent by the support of alumni, friends and industry, and it's already clear to me that the community has our back. We have some very exciting years ahead." 

 Learn more about the campaign and watch a video about the impact of private support at giving.mines.edu/campaign.

Recognizing and Meeting a Need

Brennan Mayhak was delighted when he received news that he had been accepted to Mines, but his elation was tinged with concern—he wasn't sure how he could pay for his education past the first year. The sophomore studying mechanical engineering is the oldest of six children, all home-schooled by their mother, although he'd attended Red Rocks Community College part time during 11th and 12th grades.



Then, just two weeks before his first day at Mines, he got a congratulatory email from Bruce Goetz, Mines' director of admissions, letting him know he had

received the Russell Badgett Jr. Endowed Scholarship. "The scholarship was a sign of sorts to me that I had picked the right school for my education," Mayhak says.

The scholarship was established in honor of Russell Badgett Jr. '40 by his son, Bentley Badgett II '74, upon the death of his father in 2012. Both earned degrees in mining engineering. Russell served in World War II and later owned and operated coal mines in western Kentucky for more than 50 years. With his brothers, Rogers Badgett Sr. and Brown Badgett Sr., he pioneered the use of draglines in surface mining.



2005 Marquez Hall fundraising is kicked off when Tim '80 and Bernadette Marquez announce a \$10 million challenge grant. With the help of almost 200 alumni, friends and corporate partners, the Petroleum Engineering Department's \$27 million new home is opened in 2012.

Construction of the **Student Recreation Center** is supported with gifts of \$3 million from John '52 and Erika Lockridge, \$2 million from the Adolph Coors Foundation, and numerous additional private donations. The building opens in 2007.



2009 The Harvey Scholars

Program is established with a \$10 million gift from Hugh '74, MS '80 and Michelle Harvey.

2012 The Harveys contribute an additional \$11.2 million to the scholarship program. It remains the largest single gift in Mines' history.

The **Grandey University Chair in Nuclear Science and Engineering** is established with a \$3 million gift from Jerry '68 and Tina Grandey.



Clear Creek Athletics Complex fundraising kicks off with private commitments totaling \$9.5 million.

2013 The F.H. "Mick" Merelli/Cimarex Energy Distinguished Department Head Chair in Petroleum Engineering is established with a gift of \$3.5 million from Cimarex.

The **Transforming Lives** campaign is publicly launched, with a goal of \$350 million.

An Interview with President M.W. Scoggins

The Road Ahead



Tyson Brown '08, MS '11

Seven years into his presidency, with plenty of milestones on record, a capital campaign in full swing, and some big changes on the horizon for Mines, we recently sat down with President Scoggins for an informal Q&A. Partly retrospection, partly introspection and partly forward-looking, the conversation that follows will be of interest to all those who support the growth and success of Mines, and are curious to learn more about its president.

Mines: Nearly seven years ago, you transitioned from the corporate world to academia. What motivated your decision?

Scoggins: Not too long before I retired after more than 35 years in the oil and gas industry, I joined the board of trustees of my alma mater, the University of Tulsa. After I retired, I became increasingly active, serving on the executive committee and spending a great deal of time on campus. My wife and I both enjoyed the experience of being involved in the university. When I received the call from Mines asking me to consider being a candidate, I realized this was an opportunity to be part of a remarkable community.

Mines: What aspects of leading Mines do you find most rewarding?

Scoggins: The most rewarding moments revolve around students—seeing them be successful. I'm getting ready to participate in my 15th commencement, so I have had the opportunity to watch many wonderful students walk confidently across the stage, proud of their accomplishment, and poised to make great contributions to society. It's very special to be a part of that.

I recently heard about an alumnus who is about to graduate from the University of Texas with master's degrees in environmental engineering and public policy. At Mines, he was a lineman on the football team, and we got to know each other a little. Whenever he saw me on campus, he'd ask, "You gonna come to the game this weekend?" At his graduation, just before I handed him his diploma, I called out his jersey number and said, "James Tyree, #65, you did a hell of a job." I got the biggest bear hug I think

any president's ever gotten during a college graduation ceremony.

Karen and I try to attend as many student activities as possible—from athletic events to plays and concerts—and we enjoy them all. I particularly enjoy the graduate research conference and looking at the students' posters, even though I have to admit I really don't understand all of them.

Really, the most rewarding aspect of my job is seeing the growth in our students over their time at Mines, which is a testament to their own hard work and to the dedication of the Mines faculty and staff who teach and interact with them.

Mines: When you speak to individuals or groups less familiar with the university, how do you make "the case for Mines"? What does the university have to offer that sets it apart?

Scoggins: I talk about the focused nature of the school's mission, the quality of the education our students receive, and the relevance of our research programs. Mines is uniquely positioned to deal with global challenges related to our focus areas of earth, energy and environment. These issues are at the forefront of the world's most pressing concerns, and Mines is playing a critical role in educating students who will be leaders in addressing them—through their careers and through meaningful research.

I also always point out something you will hear from almost every Mines alum—and that I completely agree with—which is that our students develop a work ethic unlike almost any other university. By the time they graduate, our students truly have the skills to hit the ground running. They are a very special group.

Mines: The financial crisis erupted relatively early in your presidency. This must have posed some significant challenges.

Scoggins: When I interviewed for the position, the board of trustees indicated they wanted a lot of focus on the school's financial condition. When I arrived, Mines was already in the process of putting together the all-funds budget. We tightened down our systems, controlled our costs and planned carefully. As a result, we have managed to weather some major cutbacks in state funding. We faced some financial challenges, but the school came through it with minimal adverse impacts.

Mines: In fact, you've overseen more building on campus than has taken place during any seven-year



“ Our students develop a work ethic unlike almost any other university. ”



period in Mines history. How has this been possible? What has driven the expansion?

Scoggins: When I came to Mines in 2006, the school had recently finished a strategic plan and had been through a period of tremendous growth. It was clear that we had a significant shortage of academic infrastructure that had to be addressed immediately. We also needed to build the school's residential capacity.

We faced a big challenge in financing these major building projects and used the full range of financing options available to us to make them possible. The students voted in favor of a capital fee that enabled us to expand Brown

Hall. The state funded the Center for Technology and Learning Media expansion. We had private donors who funded Marquez Hall and the W. Lloyd Wright Student Wellness Center. We used our balance sheet to borrow money to allow us to construct the residence halls. We have made strides in catching up with our infrastructure needs, but we still have a long way to go when we look at current campus needs and where we see the school going in the next decade.

Mines: So what's next, in terms of construction?

Scoggins: The Elm Hall residential and dining facility is under way, and the Welcome Center and privately funded Clear Creek Athletics Complex will all be under construction this year.

What's next? We are discussing funding with private donors and the state of Colorado for a new cornerstone academic building to house physics and several other disciplines. The Green Center needs significant renovations. The library needs to be considered in our future planning, as well as a new research facility. And we anticipate continued growth in graduate enrollments, which may make another addition to Mines Park necessary. It's a long list, with a big dollar commitment associated with it.

Mines: As we near the end of 2013, what do you believe are the top three strategic priorities for Mines?

Scoggins: Over the last few years, we haven't just increased the size of the student body; we've also raised the bar for admissions. Now we need to improve our retention and graduation rates. I want to see more of

“ The most rewarding moments
revolve around students—
seeing them be successful. ”

our students complete their degrees, so they can go on with their careers and lead successful lives. We are making progress—our freshmen-to-sophomore retention this fall was the best in decades, and I suspect that is because of the changes we’ve made to create a more supportive and diverse community environment—but I believe we can do better. Our top priority must be to improve student outcomes.

Second, we need to attract talented new faculty to join our remarkable and highly regarded corps of teaching and research professors. It takes a world-class faculty—in the classroom and the lab—to attract the best and the brightest students and provide a first-class education. One way we’ll achieve this is by encouraging continued growth in our research programs. Funding in this area has tripled in recent years, bringing with it great opportunities for faculty and students.

Third, we must continue to improve the school’s financial position so we have the flexibility and agility to take advantage of opportunities and implement our vision. The financial model for public higher education has changed, probably forever. It’s unlikely that there will be a significant influx of state funding, so we must forge our own path forward with value-based tuition revenue, a solid balance sheet to enable us to prudently borrow funds when needed, and a robust endowment and annual gifts to sustain the university.

Mines: How will the *Transforming Lives* campaign help address these priorities?

Scoggins: The campaign goals and our institutional priorities line up almost exactly one to one. Student outcomes are enhanced when we have financial aid resources to provide

scholarships and fellowships, and to support undergraduate and graduate research programs. Creating new endowed chairs and professorships strengthens our faculty. Gifts to capital projects enable us to move forward in creating an infrastructure that matches our world-class programs.

Mines: How are the goals of this campaign different from Mines’ past campaigns?

Scoggins: The financial goal, \$350 million, is substantially higher than past campaigns. Many of the areas we’re focused on—student support, faculty support and capital needs—are similar. We will still be relying on the support of our broad alumni base, the corporations that have historically supported us, and donors who are friends of the school. But we will also be reaching out to new potential individual and corporate donors to broaden our base of support.

Mines: The job of leading a university is a serious one, but there must be some humorous moments along the way. Does one in particular come to mind?

Scoggins: The first semester I was here, close to December graduation, Karen and I were walking to a basketball game on a Saturday night when I looked up at the M. But instead of an M, I saw a lowercase b, and immediately thought some students from Boulder had pulled a prank.


I called public safety (which on the weekend rolls over to the Golden

Police), identified myself as president of the school and explained my concern. After the dispatcher said they would check on it, we went into the game and sat down next to two alums. I asked if they’d seen the b on the M. They looked at each other, grinned and said, “Has no one told you about the countdown to graduation? That’s a 6, not a b.”

When I called Golden Police back, I could hear laughing in the background. The dispatcher said, “Well, President Scoggins, whatever you do, don’t leave the building until we call off the SWAT teams.” They were just dying laughing.

Mines: Is there anything you’d like to say that we haven’t asked you about?

Scoggins: We’ve talked about adding new buildings to campus, and expanding our faculty and graduate enrollments, but I want to make it clear that while we’ve enjoyed significant enrollment growth in the last few years, we recognize the value of our relatively small size. Future growth is going to be carefully managed.

We also talked about the importance of the campaign to the university. I’m not sure I adequately conveyed the depth of my appreciation to the alumni and friends who have always been there to support us. There are folks out there I can call and say, “We need your help,” and they can always be relied upon to support the school. I’d like to be able to say, “This is the last time I’m ever going to call and ask for your help,” but it won’t be. I just want all our loyal friends and supporters to know how very important they are to Mines. 

DRIVE PRODUCTIVITY WITH MICROMINE

MICROMINE's exploration and mining software solutions are used by mining companies worldwide to drive productivity and cost efficiency.

MICROMINE's solutions cover the entire mining process, from exploration through to mine production. No matter what stage of mining you're at, MICROMINE will help you achieve your objectives faster and more affordably.

Located in 24 of the world's major mining capitals, our team is close to your operation. This means MICROMINE can provide you with local support and services in your language and time-zone.

Our intuitive solutions are delivered by regional specialists who understand the industry and the software, and know how it can be integrated into your operation for maximum results.



www.micromine.com

T: +1 (303) 996 6270 E: mmusa@micromine.com

Australia • Brazil • Canada • Chile • China • Indonesia • Kazakhstan • Mongolia • Russia • South Africa • Sweden • Turkey • Ukraine • United Kingdom • USA

A Laser's Edge



Tyson Brown '08, MS '11

A Mines
alumnus-
professor
pushes the
envelope on
laser technology.

By Lisa Marshall

HOW CAN LIGHT be manipulated to slice a clean incision in the fragile lens of a human eye? Or to create three-dimensional videos of processes deep inside the brain? Or to carve a tiny laboratory on a microscopic chip?

These are not the questions Jeff Squier '84, MS '86 was pondering in 7th grade, when he wrote the words "optical physicist" on a questionnaire asking what he wanted to be when he grew up.

"Really, I just liked the idea of playing with light," he recalls.

Thirty-nine years later, that boyhood fascination has led the Mines physics professor and researcher to not only ask such questions, but also answer them by designing and building ultra-fast lasers that can cut, image and micro-machine in ways never before possible. His research team's creations have been used by everyone from neuroscientists wanting to peer inside the dense neuronal tangles of a fly's brain, to geneticists wanting to better understand, at the molecular level, how a corn plant grows. Through collaborations with private companies and other research institutions, they're also working to develop more affordable and accurate laser-based microscopes and safer laser-based surgical techniques.

"He isn't just building a bigger laser. He has a deep respect for the way light interacts with material," says neuroscientist and University of California, San Diego, professor David Kleinfeld, who has used Squier's lasers to chart blood flow and neuronal activity in the brains of rodents. "He is very clever in building lasers with interesting intrinsic properties. They could have a big impact."

“The complex light trick involves breaking the beam into its many colors and then lassoing them back together in a micro-instant at the focal plane.”

A better view

The first lasers were invented in the late 1950s and, as Squier puts it, were initially “a solution looking for a problem.” They moved from laboratory obscurity to pop culture fame in 1964, when the villain in the James Bond thriller “Goldfinger” used a laser to gruesomely fillet his adversaries. By the ’70s, an array of industries were finding a more practical use for them.

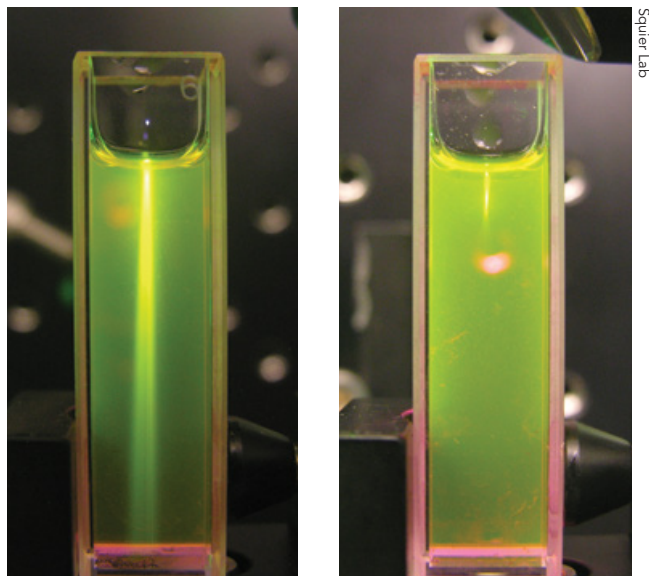
“They captivated everyone’s attention,” Squier says. “Now they’re in everything from scanners in the supermarket, to your Blu-ray player at home, to the operating room.”

But, as he points out, not all lasers are the same.

While conventional lasers use a continuous beam of light, new “femtosecond” lasers developed in the early ’80s chopped that light into infinitesimally short, ultra-intense bursts lasting just a few one-millionths of one-billionth of a second.

The possible applications of such a precise and powerful pulse of light fascinated Squier. So after earning a master’s degree in physics from Mines in 1986, he sought out one of the fathers of femtosecond lasers, Gérard Mourou at Rochester University, and went there to get his PhD in optics under his guidance.

<< Jeff Squier has supervised Erica Block’s research into SSTF focus for lasers, which has great potential for improving the precision and safety of laser surgery, particularly for eyes.



ILLUSTRATING THE POINT The two photos depict the depth of field, or length, of a standard femtosecond focus (left) and an SSTF focus (right) projected into a fluid that fluoresces as a result of a phenomena called two-photon excitation fluorescence. The benefit of SSTF is clearly visible, as the depth of focus (length) of the fluorescence is strictly confined compared to the standard focus.

Soon he was replacing the light bulbs in microscopes with femtosecond lasers—with remarkable results.

“It acts like the ultimate strobe camera,” he explains. “If I can make a very short burst of light, I can freeze motion and understand really fast events (like a material melting, or a chemical reaction occurring inside a cell). It can aid our understanding of a whole array of processes that have been too fast for us to follow before.”

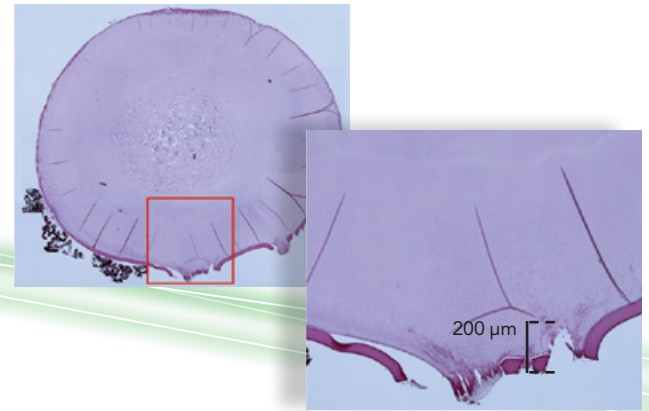
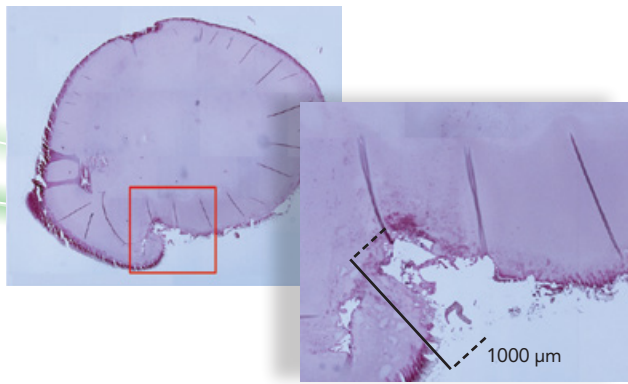
Squier notes that laser imaging was long fraught with a perplexing shortfall. Aimed at thin-walled living cells, which don’t absorb or scatter much light, they produced a low-resolution image with little contrast. They also spread their beam broadly, creating a bleaching effect far beyond the intended focal plane. And they tended to damage the sample.

“With a normal laser everything lights up. With a femtosecond laser, only the exact focal plane lights up. This is huge,” Squier says. Because it uses an infrared beam, rather than an ultraviolet one, a femtosecond laser is also less damaging to the sample. And it can penetrate deeper, allowing for exploration of cells well below the surface.

In 1992, Squier was co-inventor of the first ever video-rate multi-photon imaging system, a laser-based device that allowed biologists to take detailed sequential photos of cell activity and string them together in a frame-by-frame animation. (The technology is widely used today). He’s been toiling in the lab ever since, working to make faster, real-time, three-dimensional, high-resolution imaging possible.

In 2012, his team took a major technological step forward when they developed a system that allows for simultaneous imaging at multiple locations. Rather than take one picture at one location of a rat brain or plant stalk and then move along to another, it can take as many as six at once from six different planes, and then splice them together to create a vivid 3D video.

Thus far, it’s not commercially available. Work will start this summer on a new system at the University of California, San Diego, where it will be used to better understand the inner workings of a fruit fly’s brain. “They are really trying to understand the neural network,” says Squier. “How does a smell get converted into an electrical signal inside the brain and what path does it follow?”



A cleaner cut

Squier has also been instrumental in shaping the femto-second laser into an ultra-precise scalpel. He holds one of the original patents for femtosecond Lasik eye surgery.

And in May of this year, he, PhD student Erica Block, and colleague Charles Durfee, an associate professor in the Department of Physics, published a groundbreaking paper demonstrating that a technique called simultaneous spatio-temporal focusing (SSTF) could vastly improve the precision with which living biological tissue can be cut.

The complex light trick involves breaking the beam into its many colors and then lassoing them back together in a micro-instant at the focal plane.

“We focus the laser beam not just spatially but also in time,” says Squier. “It enables us to generate tremendous intensities and really precisely deliver the light in a controlled fashion.”

For one recent experiment, he and his colleagues made incisions in the lens of a pig’s eye, using both conventional laser technology and SSTF. The difference was stark, with the SSTF laser cutting a clean line while the conventional

LASER PRECISION

In an experiment conducted in Squier’s lab, minute laser incisions in the lenses of pig eyes were later analyzed. The areas inside the red boxes are correspondingly magnified in the adjacent, overlapping image. The pair on the left show the results of standard focus; the images on the right show SSTF focus. In addition to achieving greater precision, SSTF focus left the thin protective membrane covering the lens mostly in place—an outcome likely to expedite healing in a human patient.

laser was more jagged and bubbled—a situation that in a human patient could increase risk of complications.

Thus far, eye surgery is the most obvious application. But Kleinfeld, who is collaborating with Squier to explore surgical applications, believes surgeons who operate in extremely delicate areas—like ear, nose and throat specialists—could also benefit from the technology someday.


“It’s a way to do the cutting in a different and more efficient way,” he says.

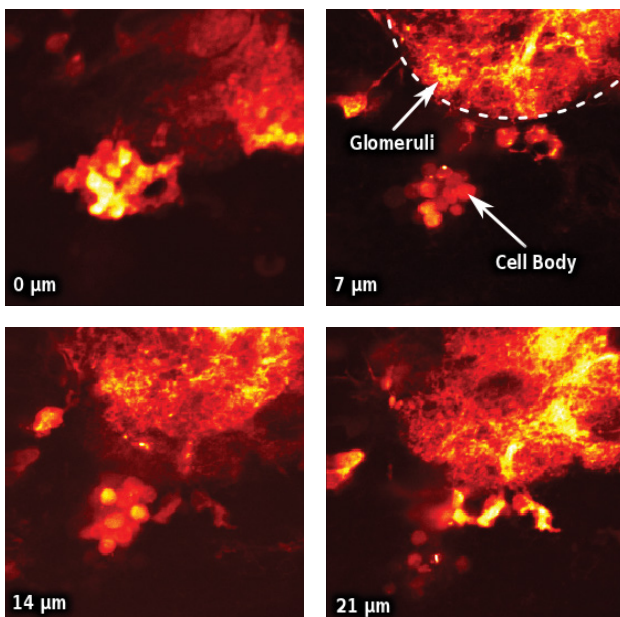
Training the next generation

Futuristic imaging and surgeries aside, Squier says he already sees immediate uses for both the cutting and imaging laser tools. The cutting tool could be used now to prototype three-dimensional glass and plastic microfluidic devices, or “labs-on-a-chip,” for conducting scientific research or medical lab tests. And already, by building custom-designed laser-based microscopes for use by researchers at Mines and other institutions, his work is saving them money.

“A commercial multi-photon microscope costs about a half-million dollars right now without a laser. My students can build one with a laser for \$35,000 that outperforms the commercial ones,” he says. “Plus, instead of making the experiment fit the microscope, we build the microscope to fit the experiment.”

Meanwhile, he’s giving his students an education they can get nowhere else.

“There are only a handful of groups in the world that develop the lasers and the technology around the lasers, and do experiments with them,” he says, noting that institutions elsewhere often buy the microscopes with which they conduct research. “We do everything and our students have to do everything. I think it gives them a unique skill set.” 



PENETRATING IMAGES Taken simultaneously using a single detector, these four images of the interior of a fly antenna illustrate cellular activity on four parallel planes 7 micrometers apart.



WHITING PETROLEUM TEAMS DELIVER AT RECORD LEVELS!



Across the US, from Colorado, North Dakota and the Rockies, to the Permian Basin and Mid Continent, **Whiting Petroleum Teams** are bringing record results.

Our operational expertise extends from hydraulic fracturing innovations, to state-of-the-art drilling rigs, solving transportation bottlenecks to maximizing recovery at our CO₂ floods by innovation and relentless striving for improvement. Whiting's asset portfolio provides a singular growth platform for years to come.



EOR

CO₂ Floods

Land

Land & Landowners

Operations

Production, Operations & Marketing

EHS

Environmental, Health & Safety

Drilling

Drilling & Completion

Exploration

Search for New Reserves



A proud member of COGA, Whiting vigorously supports the association's activities and membership in the face of new and expanding challenges to our industry in the 21st century.

WHITING PETROLEUM CORPORATION



Now Hiring:
Petroleum Engineers
Civil Engineers
Mechanical Engineers

1700 Broadway
Suite 2300
Denver, Colorado 80290-2300
303.837.1661
email - hr@whiting.com
www.whiting.com

Please be sure to visit our careers website at www.whiting.com to view open postings and apply. You can also view our exciting new video tour of Whiting Petroleum's operations.

ALUMNI NETWORK

HOMECOMING 2013

Back in Blue

Celebrations at this year's Homecoming had a special Mines twist, with a unique Field Day event replacing the traditional parade. Students, alumni and the broader campus community applied their engineering skills and athleticism in competitions like the shaving cream cheese puff toss and egg-football balance. Later, Bluegrass band Woodshed Red provided entertainment during the pre-game spirit festival, and alumni gathered on the lawn of Coolbaugh House for a mixer after an Oredigger 30-10 victory over New Mexico Highlands at Campbell Field.



Nick Sutcliffe

Homecoming Field Day activities on Saturday, September 28, proved transformative for some.

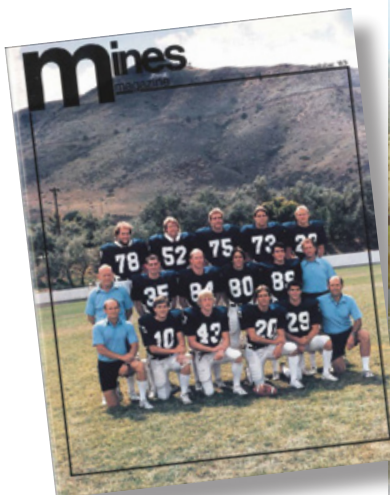


Tyson Brown '08, MS '11

On Friday evening of Homecoming, alumni and friends celebrated at the Evening of Excellence, a special event kicking off the *Transforming Lives* campaign (see p. 16). The program included an outline of campaign objectives, speeches by the president and campaign organizers, and presentation of four philanthropy awards to Steve '64 and Dollie Chesebro', Forest '03, MS '05 and Olivia '03, MS '05 Bommarito, William Fleckenstein '86, MS '88, PhD '00 and student Alex Truby. Read more about awardees at giving.mines.edu/awards2013.



More homecoming photos: minesmagazine.com/homecoming2013.



FOOTBALL REUNION

Twelve players and two coaches of the 1983 football team returned for a 30-year reunion in September, recollecting good times over a round of golf and taking time to reshoot the cover photo from *Mines'* October 1983 issue. 2013 photo, **back row, left to right:** Chip Lane '84, Jeff Osborn '86, Scott Dorsey '84, Brad Bacon '83, Mark Oberle '83. **Middle row:** Coach Robert McCandless, Lawane Luckett '84, Greg Gordon '85, Cory Wesson '83, Gary Sanchez '83, Coach Marv Kay '63. **Front row:** Mike Scherrer '83, Curt Lightle '85, Troy Tack '85, MS '91.



Chelsea Panos

ATHLETICS HALL OF FAME



On September 7, the following individuals and teams were welcomed into the Oredigger Hall of Fame Class of 2013: **Stephen Bahl** '08 (2001–2005, men's basketball), **Greg Marshall** '93 (1989–1992, football), the 2005 women's cross

country team, and **William "Bill" Henry** '62 (1958–1962, men's swimming). The latter was an unusual posthumous award in the Special Recognition category. Although he'd lost his right leg from the hip down at the age of eight, Henry was a remarkable swimmer, and held the school's 200-yard backstroke record. He is particularly remembered for his performance at a meet in 1958 at the University of Denver, where he competed in two grueling races, back-to-back. After winning the 400-meter backstroke, he hopped straight to the starting block for the 1,500-meter freestyle race, in which he swam backstroke and came in second.



For more information about 2013 inductees, visit csmorediggers.com/HOF2013.

STUDENT ASSISTANCE

Meet the Remarkable, Nontraditional, 2013–2014 Fritz Scholars

CSMAA awarded the Fritz Scholarship this fall to petroleum engineering students (left to right) Lyle Hanson, Dustin Stevens and Edward Wolfram, all of whom expect to graduate in May 2015. Administered by CSMAA, the scholarship was established by Duane '51 and Marcine Fritz (both deceased) and is awarded to Colorado residents majoring in either petroleum engineering or geology.



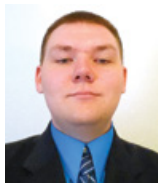
Nick Sutcliffe

Hanson has lived most of his life in South Dakota and comes to Mines after eight years of experience drilling oil, gas and water wells.

Stevens hails from Tunkhannock, Pa., and is pursuing his degree at Mines following service in the Air Force and Colorado Air National Guard (he currently is still serving in the guard). In 2010, he was deployed to Afghanistan, where he assisted with troop build-up and managed construction projects for the Marine Corps.

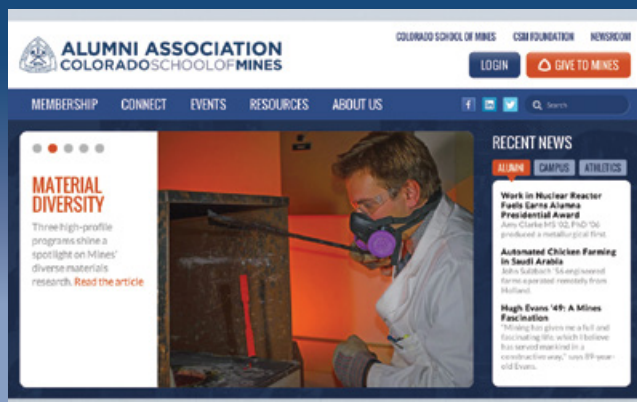
Wolfram, who is following in the footsteps of his brothers Phillip '08 and Preston '11, MS '13, is entering his second year at Mines as a senior thanks to transfer credits from college-level classes taken during high school. He is also enrolled in the McBride Honors Program in Public Affairs.

2013–2014 Coolbaugh Senior Award



This year's Coolbaugh Senior Award went to Theodore Brandt, a physics major from Northglenn, Colo., who enjoys computer programming and founded a club at Mines to promote the game Go—the world's oldest strategic board game, originating in China more than 2,500 years ago. This alumni association award provides need-based financial support to a rising senior who has achieved academic success.

STAY CONNECTED



Make sure we know how to put you in touch with other Miners. Visit minesalumni.com today and click on [Connect >](#) [Update My Info.](#)



OFFICERS

- Paul Wareham '85
President
- James R. Larsen '65
President-elect
- Jafar Tabaian '00
Secretary
- Paul Roamer MS '97
Treasurer
- Serena Bruzgo
Interim Executive Director

DIRECTORS

- Darek Bruzgo '95
- Oliver Dewey '12
- Tracy Gardner '96, MS '98
- Tyrel Jacobsen
- Susan Evers Matsushima '97
- Brady McConaty '78
- Mohan Misra PhD '86
- Paula Nolan '05
- Raymond Priestley '79
- Matthew Showalter '99
- Cooper Swenson MS '04
- Mark Taylor
- Mahesh Vidyasagar MS '00
- William Warfield '75

STAFF

- Serena Bruzgo
Interim Executive Director
- Nick Sutcliffe
Editor, *Mines* / Director of Communications
- Amie Chitwood
Managing Editor, *Mines* / Assistant Director of Communications
- Ruth Jones
Associate Director, Programs
- Kurtis Griess '08, MS '10
Office Manager
- Linda Nothnagel
- Jo Marie Reeves
- Nancy Webb
- Angie Yearous '91
Administrative Support (part-time)

COOLBAUGH HOUSE

1700 Maple St.
PO Box 1410
Golden, CO 80402
303-273-3295
303-273-3583 (fax)

csmaa@mines.edu
minesalumni.com



CLASS NOTES

1951

Walter H. Martz Jr. is the owner of Martz Oil and lives in Wichita, KS.

1957

Leroy V. Bovey is a life coach and owner of Helping People to Grow. He lives in North Fort Myers, FL.

1961

Glen R. Edwards is emeritus faculty at Mines and lives in Golden, CO.

Gabriel M. Neunzert is emeritus faculty at Mines and lives in Golden, CO.

1962

William F. Blake is the owner of Blake Brothers International and lives in Mont Vernon, NH.

Jacques A. Charest is the president of Dynasen and lives in Santa Barbara, CA.

Richard P. Reed is the president of Cryogenic Materials and lives in Boulder, CO.

1965

Lawrence G. Eagan is the president of MPT Group and lives in Apollo Beach, FL.

Dale W. Peterson is a co-owner of Ministry Press of Arizona and lives in Arvada, CO.

1967

Ronald R. Jones is the chairman and CEO of White Dog Enterprises and lives in Camano Island, WA.

Philip A. Lesser is the owner of Copal Investments and lives in Kerrville, TX.

Ronald E. Versaw is a senior project engineer for Tetra Tech and lives in Morrison, CO.

1968

George Boscoe 

James D. Bundy is a director of engineering for Subsurface Technology and lives in Crosby, TX.

Gregory Hal Hoyl is president and CEO of National Services Group based in Santana de Parnaiba, Brazil.

Fred H. Lightner is an advisor for Kaminak Gold and lives in Centennial, CO.

Theodore Smith 

David A. Wagers is the owner-operator of DAW Farms and lives in Brush, CO.

1969

Gary R. Morris is a SVP for Geovic Mining and lives in Grand Junction, CO.

1970

Cordell C. Chapman is working for KBR and lives in Crosby, TX.

Richard J. Gardner is a partner for 2RLLC and lives in Metairie, LA.

1972

Dennis W. Ferrera is the president of the nuclear business group of CH2M HILL and lives in Louisville, CO.

O. Akin Oduolowu is the owner of Akin Oduolowu & Assoc. Cons. and lives in Chantilly, VA.

James A. Townsend is the president of Tema Oil & Gas and lives in Katy, TX.

Jose A. Vargas is a private consultant for the Brazilian government based in Rio de Janeiro, Brazil.

1973

Gene M. Gehauf is working for Wood Group Mustang Engineering & Construction and lives in Houston, TX.

James J. Gusek is a senior engineer for Sovereign Consulting and lives in Lakewood, CO.

Ralph H. Lang Jr. is the owner of Ralph H. Lang Jr. Assoc. and lives in Midland, TX.

1974

Michael Flater 

John A.L. Rense is the owner of JRE and lives in Anchorage, AK.

1975

Leslie E. Apodaca is a consultant for Lynetek and lives in Colorado Springs, CO.

Dennis J. Appelhans is a process manager/metallurgist for Newmont Mining and lives in Arvada, CO.

David Ash 

Thomas G. Charles is the owner of Pump-house Brewery & Restaurant and lives in Longmont, CO.



A MINING LOVE STORY Eloise A. (Montoya) Golden '79 met her husband, Pat Golden, at a hematite iron ore mine in Wyoming in 1977, the summer before her senior year. Pat, who was studying pre-med at Loyola University of the South in New Orleans, La., worked at the mine as a sample bucket during the summer as part of a scholarship from the mine. Eloise worked in the lab. They dated during college, but parted ways after graduation: She moved to Globe, Ariz., and worked as a metallurgist in the mining industry for 20 years; he moved to Fresno, Calif. In 2003, after both had been married, had families, and divorced, Pat sent Eloise an email:

Eloise, Just wondering how you are doing. Pat

They married in June 2006. "If I had not maintained contact with the CSM Alumni Association, he would never have found me again," says Eloise. "He was the first man I ever spoke to of children, love and marriage. I am eternally grateful that he took his time to find me, and that I was a member of CSMAA!"

 denotes an individual who has recently posted photos at minesalumni.com



TRANSFORMING LIVES

The Campaign for Colorado School of Mines

giving.mines.edu

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

Anadarko Petroleum Corporation made a new commitment of \$1,250,000 to support the Department of Geology and Geological Engineering, the Department of Geophysics and the Petroleum Engineering Department.

Harold M. '68 and **Patricia M. Korell** committed \$143,650 to The Mines Fund as part of the Class of 1968 Giving Challenge.

J. Steven Whisler '84 contributed \$100,000 to The Mines Fund as part of the E-Days Giving Challenge.

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

The American Gas Association contributed \$50,000 to establish the American Gas Association Scholarship Fund.

ArcelorMittal contributed \$62,000 to support the Metallurgical and Materials Engineering Department, the Multicultural Engineering Program, the Career Center, Senior Design and the campus chapter of the Society of Women Engineers.

The ARCS (Achievement Rewards for College Scientists) Foundation committed \$50,000 in support for the ARCS Foundation Scholarship Fund.

BP made gifts and commitments of more than \$145,000 in support for scholarships, fellowships, the Career Center, the SAFE (Summer Academic Focused Education) program and the Multicultural Engineering Program.

Cameco Corporation contributed gifts totaling \$48,673 in support of a graduate student project.

Marshall C. III '67 and **Jane Crouch** made gifts totaling \$50,000 to support faculty and students in the Department of Geology and Geological Engineering and the Department of Geophysics.

Stan and **Judy Dempsey** gave \$25,000 to support Arthur Lakes Library and the Dempsey Endowed Scholarship Fund.

ExxonMobil gave gifts totaling \$54,500 in support for the Don L. and Patricia Warner Scholarship Fund, at the direction of **Don Warner '56**, as well as for several academic departments and student organizations.

Gordon L. Gray '50 provided \$50,000 in support for the Gordon Lee Gray Endowed Scholarship Fund.

Halliburton Foundation made gifts totaling \$41,000 in support for the Multicultural Engineering Program's Challenge Program, the Halliburton Female Engineers Professional Development Workshop Series, and the Making the Connection outreach event for female high school students.

Andrew M. '01 and **Jaclyn B. '01 Haney** established an endowed scholarship fund with a \$25,000 gift.

Thomas B. Huzzey '73 made a gift of \$50,000 to establish the Thomas B. Huzzey Endowed Scholarship Fund.

Robert E. Irelan '68 provided \$25,000 in support for The Mines Fund.

Howard E. '76 and **Cherine Janzen** gave \$25,000 to The Mines Fund as part of the E-Days Giving Challenge.

Michael G. '72 and **Yun C. Long** gave \$25,000 to the Long Endowed Scholarship Fund.

Maxwell L. McCormack Jr. gave \$25,141 to the Maxwell L. McCormack Memorial Scholarship Fund in memory of his father **Maxwell L. McCormack '26**.

Jack W. '72 and **Cherri M. Musser** made a \$25,000 gift to The Mines Fund.

James "Chip" A. and **Debbie Ozee** established the Ozee Family Endowment for Mines Baseball and provided additional support to the program with gifts totaling \$30,000.

Peabody Energy gave \$25,000 in support for the Department of Mining Engineering.

Geraldine Piper added \$25,000 to the Robert G. and Geraldine D. Piper Endowed Scholarship Fund in memory of her husband, **Bob Piper '49**.

Tanya Porter contributed \$28,255 to establish the Darrell D. Porter Endowed Student Support Fund in memory of her husband **Darrell D. Porter MS '62**.

SM Energy Company provided gifts and commitments totaling \$61,000 in support of the SM Energy Company Endowed Scholarship Fund, the Career Center, the Petroleum Engineering Department, and the Department of Geology and Geological Engineering.

Thomas C. '36 and **Mary Snedeker** made an additional life income gift of \$100,000.

Michael R. '83 and **Patricia K. '83 Starzer** made a \$25,000 gift to The Mines Fund.

Statoil contributed \$25,000 in support for Department of Geology and Geological Engineering field trips.

Michael S. Stoner '94 contributed \$25,000 to the Dr. Billy J. Mitchell American Driller Scholarship Fund.

Bequest distributions of \$43,583 from the estate of **Marian K. Van Kirk** will provide unrestricted support for Mines.

Fun-Den Wang provided \$25,000 in support for the Mining Water Jet Technology Fund.

Fred P. Wehrle '49 gave \$37,000 to establish his second life income gift.

*The CSM Foundation received the gifts and commitments listed here between 5/16/13 and 10/21/13.



Melinda S. Guajardo is a front desk clerk for Advanced Cosmetic Surgery & Dermatology and lives in Stateline, NV.

John R. McConnell is a supervisor for XTO Energy and lives in Fort Worth, TX.

James R. Miller is the president and COO of Brown & Caldwell and lives in Alamo, CA.

Gary L. Prost is a senior geologist for Conoco Canada based in Calgary, Alberta, Canada.

Randal D. Pruitt is a VP wells Iraq for BP America based in Houston, TX.

Gary R. Resh is a manufacturing manager for ICL Performance Products and lives in Festus, MO.

Terry R. Ritzel is a senior project manager for Freeport MacMoran, Cerro Verde and lives in Tucson, AZ.

Charles J. Schaub is a manager, operations for Alon Surface Technologies and lives in Sinclair, WY.


Andrew P. Schissler is a Denver operations manager for Ausenco and lives in Littleton, CO.

Raj Sharma is a chemical engineering professor at Columbia University and lives in Princeton, NJ.

Gary A. Van Huffel is a business development manager for the Oregon Business Development Department and lives in Salem, OR.

William A. Warfield is marketing business development – URE for Atlas Copco CMT and lives in Roseville, CA.

Thomas A. Whipple is a VP, research development for Amat and lives in Idaho Falls, ID.

Billy J. White Jr. is a principal geoscientist for Tullow Oil. 

1976

Ronald L. Brinkman is an electrical reliability manager for Flint Hills Resources and lives in Corpus Christi, TX.

Michael Carney is a subsurface technical manager for Schlumberger and lives in Houston, TX.

Scott J. Crabtree is a tax attorney for Tax & Legal Solutions and lives in San Clemente, CA.

William J. Engelhard is a metallurgical engineer for Temperature Processing and lives in North Arlington, NJ.

Bruce E. Grewcock is the chairman and CEO of Kiewit and lives in Omaha, NE.

Michael D. Hiza is a VP/manager of projects ASO for Delta-MH and lives in Story, WY.

William A. Hudson is an electrical engineer for Hewlett-Packard and lives in Fort Collins, CO.

Norman E. Kramer is a senior project manager for Atkins and lives in Houston, TX.

Jeffery J. Manion is the owner and president of 5 Jayz and lives in Midlothian, VA.

Michele K. Mudrone is a petroleum engineer for MKM Engineering and lives in Plano, TX.



MAKING THE MOST OF RETIREMENT

“My mom always told me I’d better get a good education and a good job since I like expensive toys,” says Doug Jeffries ’76, pictured here with a 70-lb tarpon that he and his buddy, Scott Heywood, caught during a weeklong camping trip on an uninhabited cay in the Bahamas. “Mines provided that education that positioned me to get a good job and allowed me to travel and fly fish all over the world.”

T. Arthur Palm is executive director, operations for Jameson Resources. He lives in Price, UT.

Don C. Rowlett is a senior manager engineering for Kennametal and lives in Bedford, PA.

James P. Schmid is a mine planning engineer for PCS Administration (USA) and lives in Washington, NC.

Edward L. Shuck is a chief geophysicist for NanoSeis and lives in Centennial, CO.

Russell W. Shurts is the owner of Shurts Accounting and lives in Centennial, CO.



PRESERVING A COLORADO LANDMARK

Nathan Torres ’03 (far left) and Cooper Best ’09 (fourth from left) are helping shore up The Crystal Mill, an oft-photographed Colorado landmark entered in the National Register of Historic Places. Working with other volunteers from the structural group at the engineering firm SGM in nearby Glenwood Springs, the team treated the exterior with preservative and conducted fire mitigation in 2012. This summer they had planned to build a coffer dam and reinforce the base of the penstock, but after an investigative dive revealed the work was not necessary, the team focused on completing a 3D scan/survey of the structure and making minor repairs.

Torres uses his 1988 Land Cruiser (shown right, newly outfitted with Mines plates) to access the site, which is 5 miles up a rough 4WD trail. “The fun part of this particular project is that I get to combine my engineering skills and personal skills—climbing and diving,” says Torres. “The icing on the cake is that we actually get to review, design and then physically implement our engineered solutions.” The mill, originally called Sheep Mountain Powerhouse, was built in 1892 to supply compressed air to a nearby silver mine. It was abandoned when the mine closed in 1917.



See a historic photo of the mill at minesmagazine.com/crystalmill.

COLORADO SCHOOL OF MINES ALUMNI GOLF TOURNAMENTS

THANK YOU TO OUR 2013 SPONSORS

13th Annual Endowed Scholarship Golf Tournament – Houston

Volunteer Sponsor

The Chesebro's –
Steve '64, Scott '92,
Michelle '94

Gold Level Sponsors

AccuTrans
Kanaly Trust
Southwestern Energy
Swire Oilfield Services

Prize Sponsors

Schlumberger
Woodul family – Doug
'78, Susan, Megan '10,
William

Breakfast Sponsor

John Gray '64

Lunch Sponsor

WesternGeco

Silver Level Sponsors

Apache
CGG
Crescent Directional
Drilling
EP Energy
Noble Energy
PDC Energy
Statoil
Truth Products
White Eagle Exploration

Blue Level Sponsors

EOG Resources
FairfieldNodal
ION GX Technology
Leslie Penello '79
The Morris Maue Group
– Merrill Lynch
Newfield Exploration

Hole Sponsors

Ceramic Technologies
CustomBag
Harold Dunn '53
Environmental Resources
Management (ERM)
Gyrodatta
Kim '74 and Chris
Harden '00
President M.W. Scoggins
Ken Spalding '60
Dean Stoughton '75,
MS '78

Total raised this year:

\$49,650

Total donations to date:

\$435,975

Scholarship funds awarded to date:

\$76,045

2012–2013 recipients



Ryan Bott
Junior
Petroleum
Engineering



Matthew K. Cutt
Senior
Mechanical
Engineering



R. Henry Kaetzer '12
Petroleum
Engineering



Marisse J. Vista
Senior
Math &
Comp. Science

29th Annual Golden Golf Tournament

Luncheon Sponsor

Noble Energy

Beverage Sponsors

Calfrac Well Services
NCS Energy Services

Reception Sponsor

White Eagle
Exploration

Prize Hole Sponsor

LMKR

Hole-in-One Sponsor

Halker Consulting

Putting Contest Sponsor

Baker Hughes

Volunteer Sponsor

Golden Software

Hole Sponsors

Atlas Copco CMT
Banks Insurance
Agency
Coral Production
Credit Union of
Colorado
Cross D Bar
Recreation
Foundation
DCP Midstream

Jim Larsen '65
Liberty Mutual
Lockheed Martin
MHA Petroleum
Consultants
President M.W.
Scoggins

In-Kind Support

CSM Bookstore
Cross D Bar
Recreation
Foundation
Golden Natural Foods
Hiwan Golf Club
Indulge Bistro & Wine
Bar
The Keg Steakhouse
& Bar

4th Annual Endowed Scholarship Golf Tournament – Oklahoma

Silver & Navy Sponsors

Baker Hughes
Chesapeake Energy
Crescent Directional
Drilling
Crescent Services
MS Energy Services
Nomac Drilling
O-Tex Pumping

Platinum Sponsor

Halliburton

Gold Sponsors

Mathena
MidCon Compression
The Turbulator
Company

Silver Sponsors

Hodges Trucking
Pilot Logistics Services
Sunbelt Oilfield Supply

Beverage Sponsors

Capital Distributing
Yong Cho '92
Rene St. Pierre '76

Hole Sponsors

AES Drilling Fluids
Archer Directional
Drilling Services
Johnson Controls
LEAM Drilling Systems
LT Energy Services
The Mud Masters
Group
Newpark Drilling
Fluids
Pason Systems
President M.W.
Scoggins
Tres Management
Trinidad Drilling

Prize Sponsors

Bank of Oklahoma
BC Clark Jewelers
Chick-fil-A
Five Guys Burgers and
Fries
Johnnie's Charcoal
Broiler
Mahogany Prime
Steakhouse
Pancho's Liguortown
Ranch Steakhouse

Total donations to date:

\$105,000

Scholarship funds awarded to date:

\$24,000



ALUMNI ASSOCIATION
COLORADO SCHOOL OF MINES

SAVE THESE DATES FOR 2014:

HOUSTON—FRIDAY, APRIL 4

OKLAHOMA CITY—FRIDAY, MAY 2

GOLDEN—MONDAY, JUNE 2

David M. Skelton is a competence management project manager for BP and lives in Brookshire, TX.

Joseph P. Slattery is a VP drilling and HSE&R for W&T Offshore and lives in Houston, TX.

Richard W. Smith is a reserves manager for Maersk Oil and lives in Denver, CO.

Vasantkumar Thakkar 

John R. Underhill is an NOJV D&C manager for Chevron and lives in Richmond, TX.

Samuel I. Vera is a lead planning engineer for Exxon Mobil and lives in San Bruno, CA.

1977

Randal S. Barnes is a regional VP for Newmont Gold and lives in Delta, CO.

Charles J. Barthel Jr. is a senior civil engineer for Jefferson County Planning & Zoning and lives in Golden, CO.

John D. Bruno is the owner and president of Key Engineering Solutions and lives in Mount Laurel, NJ.

Brent K. Christner is a senior director of engineering for Eclipse Aviation and lives in Albuquerque, NM.

David E. Dombrowski is a program manager fuel fabrication for Los Alamos National Laboratory and lives in Los Alamos, NM.

Elane C. Flower-Maudlin is the owner of Excelsior Orchard and lives in Paonia, CO.

Daniel J. Helgoth is a facilities engineer for Marathon Oil and lives in Lafayette, LA.

Robert L. Koch is a senior mining engineer for Strata Worldwide and lives in Fairmont, WV.

Guy M. Lawyer is a plant engineer for Independence Tube and lives in Lombard, IL.

Jerry M. Nettleton is a manager – environmental affairs for Twenty-Mile Coal and lives in Steamboat Springs, CO.

Mark J. Norden is an EVP for E. Dillon & Company and lives in Abingdon, VA.

Erol Ozensoy is chairman of Kimetsan Chem Group based in Kizilay-Ankara, Turkey.

Jeffrey A. Russell is a market development manager for North America Kraton Polymers and lives in Conroe, TX.

Daniel J. Shearer is a senior advisor – geophysics for Chesapeake Energy and lives in Oklahoma City, OK.

Joseph W. Stinson is a group VP for Ashland Oil based in Wilmington, DE.

Michael E. Ward is a senior staff production engineer for EP Energy and lives in Katy, TX.

1978

Manouchehr Bahavar is a product specialist for IRIS Data Management Center based in Seattle, WA.

James E. Bond is a senior raw materials engineer for Lafarge North America based in Pointe-Claire, Quebec, Canada.

T. David Burleigh is a professor for New Mexico Tech and lives in Socorro, NM.

Mark F. Coolbaugh is a chief geoscientist for Renaissance Gold and lives in Reno, NV.

Jill Ivey Farnsworth is a principal engineer for Nuclear Waste Partnership and lives in Carlsbad, NM.

Mukesh K. Gupta is a consulting engineer for URS – Professional Solutions. He lives in Augusta, GA.

Jeffrey J. Johnson is a project manager for Chevron and lives in Sugar Land, TX.

Linda J. Lindstrom is the chief, Applied Sciences Bureau for South Florida Water Management District and lives in Palm Beach Gardens, FL.

Debra L. Meyer is a manager for Martignetti Liquors and lives in Melrose, MA.

Paul R. Millet is an environmental project manager for Terracon and lives in Elizabeth, CO.

THANK YOU FOR SUPPORTING THE SENIOR CLASS OF 2013 FIGHT FOR SURVIVAL CHALLENGE.



Together, you made a significant impact for Mines this year!

Combined with President Scoggins' match, you raised \$5,300 for The Mines Fund, your academic departments and other areas of need on campus. Your investment in Mines as students and now as alums keeps the Mines spirit alive!



Learn how you are making a difference at giving.mines.edu.



SALUTE THE M Nicholas Zehring '10 married Maggie Kay Pingolt on April 6, 2013, in Scottsdale, Ariz., surrounded by several Mines alumni: Jason Lehman '11, Nate Dirks '10, Brody Coxen '10, Darren Doherty '11, August Heffner '11, Jacob Richey '09 and Sheila Gardella '12.



NEW IN TEXAS James '02 and Jennifer Hochnadel announce the birth of their first child, Ethan, on September 28, 2012. They live in Houston.



IRRESISTIBLE On June 26, 2012, Sofi was born to Ustun PhD '09 and Yasemin Duman.

GO MINES Daven was born May 24, 2013, to Jonathan '06 and Caitlin '06 Wilson. He joins big brothers Josiah (3) and Collin (2).



STARTING MARRIED LIFE IN PARADISE Julia Oakes '03 married Joshua Diehl on October 13, 2013, in St. Thomas, U.S. Virgin Islands.



BRONCO BUDDIES Twins Leland (left) and Landon were born July 9, 2012, to Rees '05 and Kathryn Armin.



PDC Energy is a highly successful independent energy company engaged in the development, production, and marketing of natural gas and oil. Founded in 1969, PDC Energy's business focus is in the Wattenberg Field in Colorado as well as the Utica Shale play in Ohio and the Marcellus Shale in West Virginia. If you are interested in joining our team please visit our website for a full list of career opportunities.

CAREER OPPORTUNITIES

Colorado, Ohio, and West Virginia

Please visit our website for career opportunities:
WWW.PDCE.COM

CAREERS INCLUDE:

- Petroleum Engineering
- Field Supervisors
- Landmen
- Pumpers

Submit resumes to:
HR@PDCE.COM

All applicants are subject to a background check. PDC Energy is an Equal Opportunity Employer.

Charles V. Monninger is a manager of innovative contracting for Mowat Construction and lives in Woodinville, WA.

James J. Moore is a VP for St. Augustine Gold & Copper and lives in Gilbert, AZ.

Peter M. Mueller is a SVP operations for Saga Petroleum and lives in Centennial, CO.

Art J. Nelson is a physicist for Lawrence Livermore National Lab and lives in Livermore, CA.

Kenneth J. Nelson is a GM exploration, Europe – Eurasia – Middle East for Chevron and lives in Sugar Land, TX.

Douglas A. Patterson is a senior safety engineer for the State of California and lives in El Dorado Hills, CA.

Jeffrey P. Sattler is a SVP of technology for Lloyd's Register and lives in Houston, TX.

Brian W. Sherwood is a senior consultant for ERM and lives in Suttons Bay, MI.

Robert M. Taylor is the COO of U.S. Silver & Gold and lives in Livingston, MT.

John S. Voris is a project executive for IBM and lives in Scottsdale, AZ.

Bruce D. Wilkinson is an RND research engineer for Los Alamos National Laboratory and lives in Rio Rancho, NM.

Shelley J. Skopinski Wolf is a senior systems engineer for Wise Alloys and lives in Muscle Shoals, AL.

1979

David A. Bird is a GM, Rockies/mid-continent for Microseismic and lives in Highlands Ranch, CO.

Thomas F. Buchholz is a consultant for Marengo and lives in Arvada, CO.

Martin W. Chenoweth is a senior mining geotechnical engineer for Tetra Tech and lives in Grand Junction, CO.

Jay D. Cleary is the owner of Roosters Men's Grooming Center and lives in Arvada, CO.

A. Silvana Cusati is a director – business development for Latin America for Lincoln Composites and lives in Windermere, FL.

Peter A. Drobeck is the president of Golden Mining and lives in Golden, CO.

John A. Falk is a dam safety manager for the Idaho Department of Water Resources and lives in Boise, ID.

Richard E. Fraley is an advisor for The Carlyle Group and lives in Farmington, NM.

Tracy W. Gunn is a mine superintendent for Halliburton Energy Services and lives in Spring Creek, NV.

Mark M. Gygax is a senior petroleum engineer for Clayton Williams Energy and lives in Midland, TX.

Robert B. Levis is a technical representative for Alcoa and lives in Dacula, GA.

Mark W. Lockhart is a process technology manager for Burns & McDonnell and lives in Bellaire, TX.

Steven L. Losh is an associate professor for Minnesota State University and lives in Mankato, MN.

John P. Lowrey is a drilling operations superintendent for Exxon Mobil and lives in Waterman, IL.

Ken P. Marts is a technical fellow for Lockheed Martin Space Systems and lives in Morrison, CO.

Douglas K. Maxwell is a lead process engineer for Lyntek and lives in Arvada, CO.

Danford C. Moore is a project manager for DeLaval and lives in Lake Lotawana, MO.

David L. Ogan is a GM for American Operation and lives in Tucson, AZ.

Dennis A. Pieters is a reservoir engineering consultant for Aramco Services and lives in Katy, TX.

Kim D. Powers is a licensing manufacturing leader for Univation Technologies and lives in Luling, LA.

Raymond D. Priestley is a reservoir engineer for Encana Oil & Gas (USA) and lives in Denver, CO.

Ronald L. Shook Jr. is a Gulf of Mexico regional geology manager for Chevron and lives in Sugar Land, TX.

**ENHANCING
MINERALS
ENHANCING
CAREERS**

**To consult job offers and to apply online,
go to www.imerys.com**

We are looking for rare and unique resources with great potential for development, especially in emerging countries such as China, Russia, Ukraine and Brazil. If you are action-oriented and a strategic thinker with a strong spirit of entrepreneurship, we offer a unique place to work that allows you to thrive.

Our mission is simple: to add value to our customers' products or processes. Imerys includes well-known brands such as Damrec, Imerys Ceramics, Caldeyrs and Imerys Filtration.

With Imerys, a world leader of industrial minerals, you will transform to perform.

ALUMNA PROFILE

A Steep Ascent

Two days after graduating with a doctorate in mechanical engineering, Jennifer Labs '97, MS '01, PhD '04 was running her own business.

This is what aviators call a “steep takeoff angle”—an apt metaphor for Labs’ company, Paradigm Shift Solutions, which designs and manufactures cockpit simulators for pilot training schools. Founded in 2004, Paradigm has made a remarkably rapid ascent in a competitive industry. And it’s still gaining altitude.

“We stand out because of our price point,” says Labs. “Our simulators have the same high quality and high fidelity as our competitors’ products, but ours cost about half as much.” This has made her machines extremely appealing to private flight schools and university-based aviation programs, which have scrambled in recent years to meet surging demand for pilot training, driven by post-9/11 changes in the airline industry. Along with tighter security regulations and beefed-up certification requirements for pilots and instructors, airlines have increased the number of flights serving smaller regional airports by flying smaller planes. For this, they need more pilots. On top of that, novice pilots have to master ever-more-advanced cockpit technology.

All these factors have driven the cost of flight training sky high, creating a growing niche for Paradigm’s affordable products.

“Simulators are faster and cheaper to learn in,” Labs explains, “and they’re a lower-stress environment.”

Although her father spent about 30 years as a machinist and engineer at Buckley Air Force base in Aurora, Colo., the most influential advice he gave her had nothing to do with aviation. “He once said, ‘My only regret in life is not working for myself.’ He doesn’t remember saying it, but it’s something that always stuck,” says Labs. His penchant for applied, hands-on engineering also stuck.

“He was always working on cars,” says Labs. “His specialty was ’57 Chevys. When I was growing up, there were always 10 or 20 junked-out Chevys in our backyard. He had a lathe and a mill and a welding gun, so I got familiar with those things growing up.”

She now uses these tools routinely to perfect her simulator designs, which contain exact cockpit replicas of specific airplane models (such as the Cessna 172 or Cirrus SR20). Every component of the interior is faithfully reproduced, from the programmable instruments on the dashboard right down to the seatbelts. Labs designs each element from a 3D scan of the actual part, and then crafts prototypes to ensure that her assemblies offer authentic function and feel.

For example, an airplane’s flight controls, or yoke, exert varying degrees of resistance, depending on speed, altitude and other factors. Labs reproduces these forces in the simulator’s flight controls via a control-loading feature driven by rotary servomotors.



Jennifer Labs has built her flight simulation business in a high-need niche: affordable flight training for smaller airplanes.

Jason Brown '08, MS '11

From the simulator cockpit, pilots look through a virtual “windshield” that displays a streaming, true-to-life visual field generated by three projectors. Based on satellite imagery and GPS data, these extraordinarily detailed scenes are custom-designed to match the environs of each client’s airport.

“They’ll see the exact runway markers and taxiway signs that they’ll see when they’re out on the airfield in a real

plane,” Labs says. “If there’s a golf course off to the right on final approach, you’ll see it in the simulator as it would look from the air.”

Although not a pilot herself, Labs has one close at hand for advice—her husband (and Paradigm partner) Jesse Schoonover, a longtime pilot instructor who used to operate a flight school at Front Range Airport.

It was Jesse who first recognized the market opportunity for affordable simulators.

“After 9/11, the airlines had to ‘right-size’ a lot of their routes,” says Labs. “Instead of carrying half-full 737s, they started using 50- and 75-seat jets, with shorter hops and more flexible schedules.”

Regional jets’ share of commercial traffic tripled during the last decade, and they now carry roughly 50 percent of the overall passenger load. The result has been a flood of new openings for regional jet pilots—and a corresponding flood of aviators seeking the flight training necessary to compete for those jobs.

Their first simulator was a Canada Regional Jet CRJ-200. Paradigm later added simulators for single-engine Cessna, Cirrus and Diamond aircraft. In 2014, they will ship their first air traffic control simulator, which will enable trainees to track and direct simulated planes in real time. And the company is already looking ahead to the next growth opportunity in flight training: commercial drones.

Labs didn’t focus specifically on aeronautics or aircraft engineering at Mines, but she says she applies her education on a daily basis. “It was invaluable,” she says. “Mines prepared me for the fundamental hard work that’s necessary to build a company. I learned how to problem-solve—how to focus on a project and get it done.”

With Paradigm now safely aloft, Labs can ease off on the throttle just a tad. But don’t expect her to go on autopilot anytime soon.

—Larry Borowsky

Robert E. Spencer is an alloy production superintendent for Precision Castparts and lives in Gresham, OR.

Gordon L. Strobeck is the owner of Triune Energy and lives in Houston, TX.

George A. Sturgis Jr. is a VP project development for Hecla Mining and lives in Post Falls, ID.

George R. Walgrove III is a robust design quality engineer for Eastman Kodak and lives in Penfield, NY.

1980

Stephen C. Actis is a regional well advisor for ConocoPhillips based in Houston, TX.

David R. Berberick is a chief mining engineer for Hecla Mining and lives in Post Falls, ID.

Robert A. Biernbaum is a chief reservoir engineer for Renaissance Offshore and lives in Katy, TX.

Thomas S. Bruington II is a project evaluation manager for Sandstorm.

George F. Canjar is a director global new business for Hess and lives in Houston, TX.

Alan R. Clemens is the CEO of Rio Oil & Gas and lives in Montgomery, TX.

Jeffrey R. Corwith is a principal reservoir engineer for ConocoPhillips in Kuala Lumpur, Malaysia.

Dana A. Echter is a manager, fuel supply for Xcel Energy and lives in Arvada, CO.

Lance J. Galvin is a SVP reservoir engineer for SandRidge Energy and lives in Edmond, OK.

Robert W. Hanna is a corporate planning manager for ExxonMobil and lives in Houston, TX.

Sharon L. Hart is working for Joshua School and lives in Golden, CO.

Robert W. Hessek is a forensic structural engineer for Fay Engineering and lives in Denver, CO.

Jorge N. Mahfuz is an entrepreneur with Nova Bandeirante based in São Paolo, Brazil.

Michael G. Maslowski is the COO of Americas Bullion Royalty and lives in Hayden, ID.

Callie A. Ridolfi is the CEO and president of Echochem and lives in Mercer Island, WA.

Steven A. Ruehle is an engineering consultant for Orion Project Management and lives in Bellville, TX.

Rebecca L. White is a plant manager for LyondellBasell Chemical and lives in Beech Bluff, TN.

Dennis F. Wright is a VP sales for Freeport-McMoRan Copper & Gold Foundation and lives in Phoenix, AZ.

Douglas E. Yates is an operations manager for ConocoPhillips and lives in Haslet, TX.



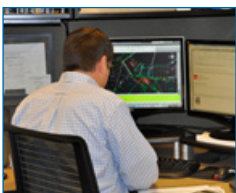
DUNE BUGGY BABY Steve '03 and Tara Maxson welcomed Lydia to their family in May 2012, joining older sister Adelaide (3).



AUTUMN JOY Andy MS '03 and Jamie '03 Headley welcomed their second child, Emerson, on March 10, 2013. She joins big brother Everett (3).



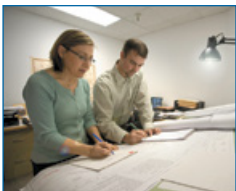
Engineering, Surveying, and Consulting Services



If you have the passion to make a difference, you may find the right career in one of our current open positions.



In addition to offering you challenging and rewarding projects, we provide competitive pay, comprehensive benefits, and 100% employee ownership.



Check out the Careers section of our website now and connect with us on social media to learn more about the exciting opportunities available to you.

www.ulteig.com/careers



THE OREDIGGER




Coverage of campus events, departmental research, academic lectures, and student life at CSM.

Visit www.oredigger.net

Editor's Note: Alumni from the classes of 1981 to 2013 who have recently updated their information online or have uploaded photos to minesalumni.com are listed below. In addition, all class notes published in *Mines* magazine since 2008 are available on the site. When you visit, if you take a few moments to enter your latest information and upload some photos, we'll list your name here in the next issue. For online viewing instructions, click on Class Notes at minesmagazine.com.

1981

John P. Ballegeer
Joel F. Brown
Kenneth W. Curfman
Arlo E. Ellison
Steven R. Enger
Robert K. Foster 
Clinton L. Harman
Roger P. Johnson
James J. Kleckner
Dawn M. Krupp
Mark J. Ludwig
Christopher M. Nyikos
James F. Pearce
W. Robert Rose
W. David Tyler
Steven C. Wilson

1982

Brice W. Barker
Matthew R. Earlam
Abdel W. El-Rabaa
Donnie R. Enns
Gerald R. McLeland
Serge Nicoletis
Eric F. Peterson
John C. Poulos
J. Wesley Powell
David J. Reimer
Kevin Stank Richards
George B. Rooney IV

1983

Charles S. Brooks
John R. Clark
Michael B. Guinn
Andrew D. Jones
Mary Revoir Jones
Julie A. Kinder
Eric H. Matheson
Norma I. Mozee
Brent P. Nelson
Kathy A. Rosborough
Ronald J. Toland

1984


Mark E. Baker
Sherry A. Barnett
Barton R. Brookman Jr.
Eric J. Dupont
Jeffrey A. Frim
Craig A. Fulton
Larry D. Kennedy Jr.
Cynthia A. Kraver
Randy L. Latta
Alan Lindsey
Stephen Liu
John M. Patterson
M. Ward Polzin
Colleen T. Porro
Dennis E. Smith
Daniel E. Wolf
Chie-Chung Yen

1985

John Anthony 
Larry E. Arnold
Kelli A. Shuter Cessna

Scott R. Clark
Robert P. Daniels
William T. Donadio
Timothy R. Fix
Catherine L. Gardner
Lawrence M. Kersting
Sophie-Adelaide
Magnier
Steven H. Sanders
Rick D. Sisk
Robert A. Spee
William T. Tack
Steven J. Wysocki




1986

Jeffrey L. Allison
David J. Becker
John W. Felten
Gregory S. Floerke
Kerry L. Hoffman
Helena C. Huckabee
Atif Khan 
Timothy M. Marsh
Mitchell S. Mather
Douglas R. Moore
Duncan W. Riley Jr.
John S. Sprackling
Anthony J. Wernsman
Sally A. Williamson


1987

Todd P. Courtney
Peter C. Dillingham
Tina Veronica Faraca
Nicholas M.
Giallourakis
Chip Hodge
Richard G. Weber

1988

Carlos A. Baptista
Christian S. Kendall
Robert D. Lawler
Timothy J.P. Lewis 
Bruce G. Sachetti Jr.
James K. Traver 
Bambang Trigunaryah
K. Shaine Tyson
Gary B. Whipple
Michael Wichmann 

1989

Douglas G. Barr 
Scott E. Biagiotti
Matthew J. Hrebar III
Diane M. Johnson
Richard R. Keagy
Timucin Kilinc
Raymond M. Lencioni
Victoria J. Marizcurrena
Jeffrey A. McClain
Richard J. Schepis
Mark E. Zitterich

1990

Xiao-Jun Deng
James E. Hall
Julia Hoagland
Dirck E. Tromp


1991

Laura S. Foulk
Peter Lo 
Brett A. McGregor
Jeffrey A. Phillips
David Ray 
Angela K. Yearous



1992

Christopher E. Elmer
James O. Emert III
Scott A. Gustafson
David C. Haines
Carlton Hamrick Jr.
Christina Hunt
Rick V. Rosser Jr.
James K. Roudebush


1993

Kevin D. Burke
Harvey S. Eastman
Bradley Horn 


1994

Bryan J. Burinda
E. Buddy Damm
Marcelino De Santiago
G. 
Kristina M.D. Fehringer
Svein Hellvik
Pelima A. Ingka
Sharon J. Jackson 
Shane A. Jones
Joe H. Kelloff
Cecilia E. Suaznabar


1995

Peter B. Barnhill
Rhonda G. Gathers
Corey F. Hartwig
Stanley A.
Kongnetiman
Erich B. Krumanocker
Pele J. Nunley 
Pedro J. Ortega
Jati U. Soenarto
Amadeu K. Sum
Michael J. Vint

1996

Ramon C. Bargas
Ronelba I. Blanco
J. Sally Bommen
Daniel J. Cutting
Robert A. Ferrera
T. Scott Geiser
Vicki Alexander Hutson
Kendra L. Lema
Karen M. McHale
Erik P. Ressel
Ryan Ricks 
Christie J. Briscoe
Zarkovich

1997

Wendy L. Church
Misty Coburn 
Charles P. Coffin
Thomas Kluck
Jason M. Koch

Sean J. Makens
John N. Marcelli
Sean A. McCormick
William P. Mulligan
Kari Susan Sanders


1998

Jennifer R. Eckels
Evan B. Genaud
Melanie E. McDonald
Jason A. Mills
David Pantoja



1999

Olivier Bardet
Brian F. Birnbaum
Larry A. Covert
Christopher J.
Greenlee
Daniel J. Grunwald
Crystal J. Heter
Brian A. Kibler
John S. Oakey
John Devlin Simpson
Russell S. Wurth

2000

Chris L. Baker
Alfred Bograh
Magdalena Boogaard
Charles D. Carwin
Geoffrey A. Eddy
David Estabrook 
Tyson S. Foutz
W. Paul Francis
Zachary S. Herman
Joshua Lau
David J. Livesay
Karen Morgan
Katherine E. Rockman
John Robert West
Matthew J. Willeford

2001

Simone M. Aiken
Hoyt A. Brown
Kimberly Cox 
Christopher Cody
Duran
Michael J. Harrington
Suzanne Moore Heskin
Donald P. Kean
Gregory P. Milligan Jr.
Dawn M. Paling
Juli A. Park
Corey A. Scheele
Angelina C. Southcott
Jennifer Strong
Whitney Trainor-
Guitton 

Kevin M. Walters
Craig R. Whipp
Kyle T. Wray

2002

Jessica M. Barlow
Ross E. Boone
Timothy A. Dolin
Eric R. Drennan
Michael R. Kelling
Kevin C. Janowski
Elliott T. Kess
Matthew Knight
Benjamin J. Lengerich
Eduardo J. Morillo
Dawn A. Schippe
Robert A. Wood

2003

Ahmed Khaleefa
Al-Neaimi
Janelle M. Bartscherer
Shawn A. Begay
Courtney Beard Bird
Forest J. Bommarito
Olivia O. Bommarito
Justin B. Buckmaster
Christina L. Clarke
Pablo A. Guzman
David N. Hutchison
Boris Kalikstein
Michael A. Keeling
Jason P. Keenan
Melinda S.A. Lee



Let Your Career Rise to New Heights with Aeroflex
Join us for the best of all worlds:
A great company and a great job in a great location.

Aeroflex Colorado Springs has an on-going search for new talent with fresh ideas to sustain our growth and stay ahead of the competition. If you are looking for a position where you are a valued employee and your contributions really count, Aeroflex Colorado Springs might be the place for you.

Aeroflex Colorado Springs is a semiconductor company located in Colorado Springs, Colorado. We design standard and semicustom integrated circuits and CCAs for defense, aerospace and commercial customers.

Aeroflex Colorado Springs periodically has requirements for engineering internships in the following semiconductor (Integrated Circuit) disciplines:

- Digital Circuit Design
- Analog Circuit Design
- Assembly Process
- Mixed-Signal Design
- ASIC Applications
- Product/Test

Please mail or email your resume in confidence to:
Aeroflex Colorado Springs, Attn: HR/dc-1
4350 Centennial Blvd.,
Colorado Springs, CO 80907
Email: hr_coloradosprings@aeroflex.com
• Aeroflex is an Equal Opportunity Employer M/F/V/D





SIX-DECADE CELEBRATION Four members of the Class of 1975 recently celebrated their 60th birthdays by completing Cycle Oregon, a supported, one-week, 400+ mile bike ride in southeast Oregon that includes about 2,200 cyclists. From left to right are Matthew Thiel, Steven Lambert, Steven S. Anderson and James Waugaman.



BLOOMING BABY Jason '07 and Darcy (Souta) '08 Stingerie welcomed their daughter, Madison, born in Norway on June 20, 2013.



IT'S GREAT TO BE ME Willa was born to John '08 and Rachel Compton on June 5, 2012.



WEDDING, THEN WYOMING Kimberly Westerhoff '11 married Ryan Cox on July 19, 2013, in Conifer, Colo. The couple lives in Powell, Wyo.

Nathan J. Lewis
Lorenzo Javier Marquez
Luke A. Michael
Christopher J. Michna
Glenda J. Rhodes
Fabio E. Sanabria S.

2004
Steven R. Adams
Roberto Federico Aguilera
Brandon R. Baker
Xaviea P. Bell
Andy J. Brisson
Stephen B. Busch
Rebecca DeMott
Lee F. Fanyo
Tyler P. Hunter
Michael S. Perez
Joshua E. Rodriguez
Jamie M. Sears
Shirley Somerville
Jesse White
T. Robert Williams

2005
Felipe H. Alves
Rees G. Arnim
Gerhard Castro
Henrik Lundin
Kelly L. Melton
Tanja Rauch
Nathan A. Rutter
Gretchen M. Miller Sauer
Paul Schwering
Luz C. Slauter
Kyle O.E. Smith
Travis A. Yenne

2006
Rassul Badran
Angela C. Casamento
Amy J. Clarke
Kimberly D. Conner
Chad W. Conry
Jeremy D. Fields
Stephanie L. Gardner
David P. Greaves
Erik H. Hunter
Elizabeth R. Major
Faisal Rasdi
Michael A. Rein
Brandon L. Segura
Megan M. Starr
Matthew D. Wiederspahn

2007
Haley M. Busche
Justin C. Chichester
Matthew Dabney
Americo Delgado
Matthew D. Duncan
James T. Martineau
Kelsey J. O'Connor
Elliott B. Petri
Erin E. Reger
Michael D. Sanders
Martin P. Schmidt
Justin C. Snyder

2008
Jeffrey R. Armstrong
David K. Bloomquist
Nathaniel W. Bock
Thomas E. Carrell III
Cayce Cullinan
Jason Fish
Aaron J. Heun
Elizabeth Jeffries
Marco A. Murillo
Mathew T. Oliver
Opeyemi A. Oyinlola
Thomas L. Papiernik
F. Chase Ruff
Indar Singh
Darcy B. Stingerie

2009
Jyoti Behura
Martin A. Briggs
Stephen E. Casaleggio
Michael A. Cozzens
Jared M. Felthager
Sarah Hodgson
Patrick R. Hunt
Zachary K. LaCount
Drew Meyer
Anant N. Pradhan
Jacob E. Rundell
Joseph D. Schneiderwind
Kyle C. Voget
Diane Wetzels
John R. Zisch

2010
Nathan C. Bland
Adam F. Botts
Lacy M. Boughdadly
Alexandra L. Swanson Clymer
Jean Pierre Fodjouo
Ginger M. Gilfillan
Hudson L. Grigg
Andrew P. Haines
Koryn R. Harrison
Cristal S. Hibbard
Sarah Koziolkowsky
Barrett A. Lavergne
Brandon D. Lewis
Jose M. Lobato Goncalves
Tracy E. McEvoy
Ashley A. Nagle
Jessica L. Robbins
John W. Rose
Liyana Rusman
Kevin A. Shaw
Bailey K. Smith
Brian L. Sulzberger
Michael T. Tedeschi

2011
Joel D. Barber
Emily C. Collett
Mark A. Daubenspeck
David J. Degeneffe
James S. Douglass
Sarah A. Hampton
Ransom D. Hamrick
Michael J. Kasberg
Charum K. Kolong

Jason J. Lehman
Anya D. Lehrner
Kathleen A. Mills
Eric J. Nydegger
Kristin Kiriluk Rabosky
Bryce A. Robbins
Katelyn E. Sandoval
Andrew P. Schaaf
Erin M. Sedlacko
Ryan K. Vera
Timothy M. Weilert
Michele L. Wiechman
Preston C. Wolfram

2012
Anil K. Bhandari
Cole E. Carveth
Josh N. Dickerson
Sean M. Gueck
Elizabeth A. Holley
Gerald Hua
Gordon V. Lu
David R. Maul
Margarite P. Parker
Mick T. Ramsey
Brian C. Rush
Rakshit Sahai
David S. Schweitzer
David R. Silverman
Mariah R. Stettner
Michael C. Strabala
Christopher D. Turrentine
Martin D. Uceda
Megan J. Yokley

2013
Fellipe M. Amaral
Caitlin E. Arnold
Wendy Belcher
Alicia E. Browder
Seth A. Buddingh
Jonas S. Cafferty
Joseph G. Caruso
Eric V. DePinto
Rachael E. Dixon
Marc W. Donnelly
Christian A. Eron
Kevin A. Fiorini
Janessa M. Foraker
Edward C. Godsell
Saundra Hunter
Elena O. Jacobs
Martin C. Krueger
Michelle L. Larson
Anthony J. Martinez
Michael B. Midyett
Denise M. Mitrano
Alexandre L. Nass
Taylor E. Pellerin
Philip J. Readle
Kristin M. Rivard
Evan T. Rowland
Sergio A. Salgado
Rebecca L. Silverstein
Joseph A. Spaur
Valerie K. Stucker
Erik C. Swanson
Joseph T. Watterson
Jordan D. Williams
Luis E. Zerpa

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



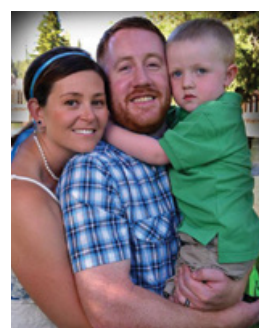
BROWN AND BLUE CONNECTION Scott Hodgson '03 and Sarah Tudor '09 married on July 5, 2013, in Granby, Colo. Several alumni celebrated with them, including groomsmen Nate Lanci '03 and Chris Nocks '03, MS '06. About two weeks after Sarah graduated, the two met playing pool at Golden's Blue Canyon, where Scott and his friend, Troy Delaplain '03, were unwinding after a busy week working on the addition to Brown Hall (see profile on Hodgson in the summer 2010 issue, p. 35). Sarah recalls, "We talked for a few hours, he asked for my number, and the rest is history!"



TYING THE KNOT UP TOP Christine Hillier '07, MS '10 and Justin Chichester '07, MS '08 first met during their freshman year at Mines, but they didn't start dating until four years later. On September 28, 2012, they exchanged wedding vows on top of Mt. Kilimanjaro, Tanzania, and were formally married on July 6, 2013. The wedding party included best man Gabriel Green '07, MS '08, Corey Brill '07 and Regina Hutchings '07.



GETTING BUSY This summer, Kyle Voget '09 started his residency in the department of Family Medicine at AnMed Health in Anderson, S.C., where he lives with his wife, Jayla, and children, Luke (on the left; born October 23, 2011) and Micah (born April 18, 2013). Both boys were born in Israel.



INSTANT HAPPY FAMILY Jamie M. Henderson '04 married Adam Sears on June 8, 2013, in Bend, Ore., with Adam's son, Kellen (4), present. Other alumni attending included Heidi (Sporleder) Brown '04, Rachel (Falon) Morrish '04 and Christine White de Ciro '05.



HAPPY COUPLE Caylynn Bowman '11 and Matthew Grall were married October 6, 2012, at Arrowhead Golf Club in Littleton, Colo. Mines alumni Cody Moery '11 and Aaron Totsch '10 were ushers. Other Mines alumni in attendance included Amanda Bell '11, Stacie (Erbes) Gallegos '11, Chance Uhrich '08 and Sean Conway '08.



BEACH WEDDING Reinhold Huber '97 and Cheryl Miller married on December 9, 2011, in Playa del Carmen, Mexico. Other Mines alumni who attended were Reinhold's brother, Danny Huber '96, MS '03, and Sean McCormick '97.



REACH FOR THE STARS Bryce '05, MS '07 and Sarah '05 Lakamp welcome their son, Connor, born August 16, 2013, ready to explore science in all its forms.

IT'S A WIND- **WIND** SITUATION



THE MINES FUND **FUELS YOUR EDUCATION**

Just as the wind moves sailboats across the ocean and propels enormous turbines to provide clean energy, The Mines Fund moves the Mines community forward with scholarships and financial aid for 80% of students.

Thank you for helping propel success through your annual contributions to The Mines Fund. Your support fuels student life initiatives, spurs innovation, and energizes the Mines experience.



COLORADO SCHOOL OF MINES
FOUNDATION



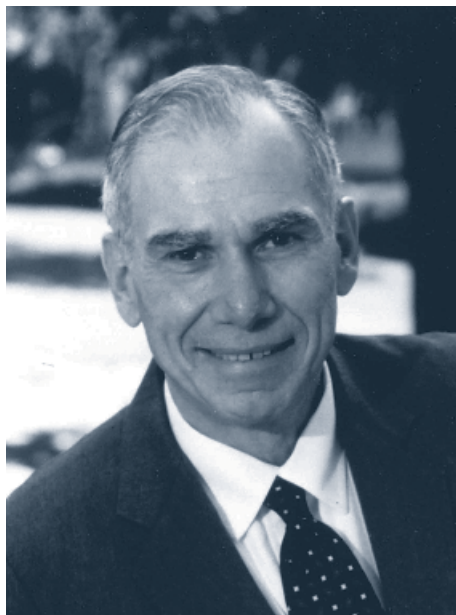
THE MINES FUND

giving.mines.edu

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



GEORGE S. ANSELL of Tucson, Ariz., died August 30, 2013. George, born in 1934, was Mines' 13th president, serving 1984–1998. After graduating from the elite Bronx High School of Science in New York, he was awarded a Naval ROTC scholarship to attend Rensselaer Polytechnic Institute, where he earned a bachelor's degree in metallurgical engineering in 1954 and a master's degree in 1955. After graduation, while serving for three years on active duty as an engineering officer in the U.S. Navy,

he was appointed to the Metal Physics Consultant Staff of the U.S. Naval Research Laboratory as a physical metallurgist. In 1958, he returned to RPI, where he earned a doctoral degree in metallurgical engineering in 1960 and joined the faculty that same year. Active in both teaching and research, he was promoted to professor of metallurgical engineering in 1965 and named Robert W. Hunt Professor in 1967. His career in academic administration began at RPI in 1969, first as chair of the Materials Division and then, in 1974, as dean of the School of Engineering.

After joining Mines as president in 1984, George and his wife, Marjorie, became enthusiastic ambassadors for the school, and together they made a formidable fundraising team. Of the school's 33 endowed and titled professorships, 17 were established under Ansell's tenure. Their impact on student financial aid resources was similarly dramatic. The student body became more diverse during his presidency, with the number of under-represented minorities and female students

rising considerably. He also had a significant influence on the academic landscape, encouraging expansion of graduate and research programs across campus and accelerating the school's evolution into a nationally recognized research university.

George worked hard to cultivate strong ties with the State Legislature, helping to secure funding for numerous capital expansion and improvement projects, including renovations to Berthoud Hall, Coolbaugh Hall, Stratton Hall, Alderson Hall, Engineering Hall, the Green Center and Steinhauer Field House, as well as a major addition to Hill Hall.

Upon his retirement in 1998, George received an honorary doctorate of engineering from Mines, and the metallurgy department was renamed the George S. Ansell Department of Metallurgical and Materials Engineering. He and Marjorie were members of the President's Council for 26 years and established the George and Marjorie Ansell Endowed Scholarship Fund in 1991, which provides need-based financial aid to undergraduates.

George was active for several decades in the American Institute of Mining, Metallurgical, and Petroleum Engineers, which recognized him in 1998 with its Distinguished Service Award. He served as a director and a trustee on the United Engineering Trustees board (1983–1997) and was a fellow of The Minerals, Metals & Materials Society, serving as president, vice president and treasurer, as well as an executive committee member (1974–1987). He was also a fellow of ASM International. At the time of his death, he was on the boards of two corporations, Cyprus Amax Minerals, which he joined in 1987, and OEA, joined in 1993.

His wife, Marjorie, who received a Mines Medal in 2000, also died on August 30. They are survived by their children, Frederick, Laura and Benjamin, and three grandchildren.



EDMUND R. BLAKEMAN '51 of Houston, Texas, died July 16, 2013. Ed was born in 1925 and grew up in California. Color blindness kept him out

of the U.S. Air Force, so he served in Army Intelligence with the 89th Division. He attended Pasadena Junior College in California, met and married his wife, Nancy, and moved to Golden, where he earned a professional degree in geophysical engineering from Mines.

Ed was a longtime petrophysicist for Superior Oil. To aid in analyzing well logs, he developed and built a three-dimensional graphical simultaneous solution to four linear equations that was called Ed's Playpen and took the shape of a box, 5 feet square. Ed became Mobil's chief petrophysicist when the company bought Superior Oil. Upon retiring from Mobil, he and Nancy moved to Kauai, Hawaii, where they remained until her death. He then returned to Texas, moving first to Dallas and then Houston.

Ed was member of the President's Council at Mines for many years and a life member of CSMAA. He is survived by his second wife, Wilodyean Gross; children Kim Blakeman, Karen Blakeman and Jane Schuelke; and nine grandchildren.



ROBERT F. BOWIE '42 of Hotchkiss, Colo., died July 23, 2013. Bud was born in 1920 and spent his childhood in Bowie, Colo. (named after his grandfather). He earned

a professional degree in mining engineering from Mines, where he was a member of Alpha Tau Omega fraternity and played on the 1939 undefeated football team. The day after his graduation in 1942, he enlisted in the U.S. Army, serving in the Army Corps of Engineers 1942–1946, primarily in Trinidad and Tobago. Bud then worked for Union Pacific Coal in Rock Springs, Wyo., before returning to Bowie in 1954 to become general manager of the Juanita Coal and Coke Company's King Mine. When the mine closed in 1975, Bud became a consulting engineer, with a brief stint as general manager of the Cameo Mine in Palisade, Colo. He retired to Hotchkiss in 1985.

Bud was a member of the President's Council for several years and established the Robert F. Bowie Scholarship in Mining at the school. He is predeceased by his wife, Sadie, brother William

Bowie '55, cousin Kenneth Bowie '30, and uncle James Bowie 1894. He is survived by his sister, Katherine Stokes, and 10 nieces and nephews, including James Abshire '79.

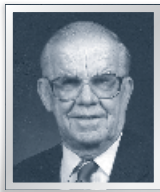


HAMDİ A. BOZBAG '42, MS '43 of Istanbul, Turkey, died February 22, 2012. Born in 1918 in Giresun, Turkey, Hamdi studied engineering at Istanbul University. He received the Institute

of Mining Engineering Scholarship from Mineral Exploration Research (MTA) in 1937 to study in France, but enrolled at Mines in 1939 when World War II began. At Mines, he earned professional degrees in geological engineering and mining engineering, as well as a master's degree in geology.

After graduation, he worked as a research engineer for an oil company in Houston and then in 1944 returned to Turkey, where he completed his military service. He worked for the Institute of MTA for two years and then started two businesses: Besiktas Engineering in Istanbul in 1949 and Barit Maden in 1956. After the revolution in Turkey in 1960, Hamdi spent two years in prison. He restarted his career in 1963 in Ankara, Turkey, establishing Barite Ore; in 1970 he returned to Istanbul and opened the country's first strontium mine in 1972. A year later, the world's largest deposits of celestite were found in it.

Hamdi was a member of the President's Council at Mines. The Hamdi Bozbag Anatolian High School in Giresun is named after him.



VICTOR BYCHOK '42 of Dallas, Texas, died April 26, 2013. Vic was born in 1920 to Russian immigrant parents in Claremont, N.H. He received a New

Hampshire State scholarship in 1938 to attend Mines, where he was a member of Kappa Kappa Psi honor society and earned a professional degree in petroleum engineering.

Vic's career began on a geophysical seismic crew with Atlantic Refining Company; he worked for ARCO for 41 years as a geophysicist until he retired in 1985. During his career, he worked all over the world: Australia, Bolivia, Canada, Cuba, Libya, Malta, Syria, the U.K., Louisiana, Texas and the Gulf of Mexico. After retirement, Vic volunteered

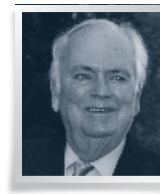
in the Presbyterian Hospital emergency room and GI Lab, and volunteered for AARP doing income tax returns. Vic is survived by his wife of 58 years, Clarlyn; daughter Victoria Ann Bychok Seitz; and four grandchildren.



CHARLES W. CAMPBELL '47 of Tucson, Ariz., died July 7, 2013. Born in 1922, Chuck attended Mines 1940–1943 and 1946–1947, his education

interrupted by service in the U.S. Army Corps of Engineers and the U.S. Marine Corps Engineers. After earning a professional degree in mining engineering from Mines, where he was a member of Alpha Tau Omega fraternity and Theta Tau honor society, Chuck worked for Asarco's Mexican mining department in Mexico until 1973. By the time he and his family returned to the U.S., he had advanced to VP of mining and exploration operations in Mexico City. He was subsequently named general manager of the Western Mining Division of Asarco and retired from that company in 1982.

Chuck received a master's degree in industrial management from the Massachusetts Institute of Technology in 1963. He was a member of the Legion of Honor; the American Institute of Mining, Metallurgical, and Petroleum Engineers; the Society of Mining Engineers; and the Mining and Metallurgical Society of America. Chuck was predeceased by his wife, Dottie; he is survived by his daughter, Debbie.



THOMAS J. CARNEY '51 of Golden, Colo., died February 3, 2013. Tom was born in 1926 and orphaned by the age of 17. He was drafted

into the U.S. Army after graduating from Culver Military School in Indiana on D-Day, June 6, 1944. As a second lieutenant, Tom spent two months in charge of a disarmed enemy forces camp in Landau, Germany, where he was responsible for 35 German generals, one colonel and 16 Waffen-SS non-commissioned officers. Eventually he attended their war crime trials in Nuremberg.

Tom earned a professional degree in petroleum refining from Mines, where he was a member of Sigma Phi Epsilon fraternity and met his first wife, Patricia Amack; together they had two children. For two years he owned a business refining motor oil, but sold it to pursue

a law degree, which he earned from the University of Colorado in 1956. He opened a law firm in Golden—Bradley Carney and Johnson—with Leo Bradley '49 and two other partners located on Washington Avenue above Ace-Hi Tavern.

Tom was a member of the Jefferson County School Board (1953–1958), chairman of the Jefferson County Republican party, attorney for Jefferson County (1960–1963), attorney for Golden City (1965–1973), and a member of the Colorado Racing Commission (1972–1986). He was also one of three promoters who brought the Beatles to Red Rocks Amphitheater in 1964.

Tom was a member of the President's Council at Mines for several years. He is survived by his second wife, Min; children T.J. and Diane; three grandchildren; and three great-grandchildren.



THOMAS H. COLE '43 of Centennial, Colo., died January 27, 2013. Born in 1921, Tom joined ROTC at Mines and was a member of the ski team, Alpha

Tau Omega fraternity and Blue Key honor society. He earned a professional degree in mining engineering before accepting a commission in the U.S. Army's 10th Mountain Division. He was awarded the Bronze Star following his service in Italy.

Tom's career in the oil business—as roughneck, geologist and independent operator—lasted 20 years in Midland, Texas. When that industry began to slow, Tom returned to his education and spent the rest of his career in mining. He was president of New Idria Mining in Fresno, Calif., for four years, before moving with his family to Denver. A member of the Mines ski team, he was inducted into Mines' Athletics Hall of Fame in 2001. At the age of 86, he and his wife, then 82, still enjoyed skiing together.

Tom is survived by his wife of 65 years, Connie; children Jess, John and Kathryn; six grandchildren; and two great-grandchildren. His son, Matthew, predeceased him.



DAVID L. DEGIACOMO '73, MS '80 of Golden, Colo., died July 6, 2013. David was born in 1950 to Col. Frank '32 and Laura Maio-DeGiacomo. He was recruited by

Coach Jack Hancock to wrestle at Mines. David earned his bachelor's degree in

metallurgical engineering and later, after a U.S. Army commission, a master's degree in mineral economics. He was also a member of Sigma Nu fraternity. David organized and established the Colorado Chapter of the National Wrestling Hall of Fame and was also a wrestling official. He is survived by his brother, Frank, and his godson, Zane Lambert.



RICHARD F. DEWEY '43 of Grand Junction, Colo., died February 11, 2012. Born in 1920, Dick earned a bachelor's degree from Mesa State College in Grand Junction and a profes-

sional degree in mining engineering from Mines. After graduation, he served in the U.S. Navy as executive officer on a sub chaser in the Pacific during World War II until he was discharged as a lieutenant in 1946.

Dick worked as a mining engineer for Anaconda Copper Mining, Standard Coal, Hamilton Overseas Contracting and American Gilsonite; he spent the bulk of his career with the latter, where he achieved positions up to VP and manager of operations and contributed to some of the early horizontal tunnel and shaft boring technology. He retired in 1985. Dick was a member of a number of organizations, including the American Institute of Mining Engineers, the Society for Mining, Metallurgy and Exploration, Grand Junction Geological Society and CSMMA.

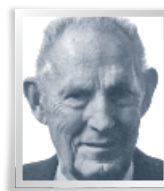
Dick was predeceased by his wife, Frances. He is survived by his children, William Dewey, Louise Hernandez and Jane Henderson; seven grandchildren; and three great-grandchildren.



THOMAS G. FAILS JR. '54 of Denver, Colo., died April 14, 2013. Born in 1928, Tom earned a professional degree in geological engineering from Mines, where he was a

member of Alpha Tau Omega fraternity. His career spanned 40 years in the oil and gas industry; he started as a geologist for Shell Oil, moved into an offshore exploration manager position for Grynberg & Associates, and then served as VP of Trend Exploration in the 1970s. In 1997, Tom became an independent petroleum geologist and consultant, and in 2000, he became president of Pannonian International, a coal

bed methane development company with properties in Europe and Australia. He is a past president of the American Institute of Professional Geologists. Tom was predeceased by his wife, Ivy; he is survived by his children, Glenn and Nora.



RAYMOND R. GUTZMAN of Golden, Colo., died April 14, 2013. Born in 1919, Raymond joined the faculty at Mines in 1949 as an assistant profes-

sor in the Department of Mathematics. He became an associate professor in 1967 and later full professor and professor emeritus. He earned an A.B. degree in mathematics in 1941 from Fort Hays State College and a master's degree in the same field in 1946 from Iowa University. Prior to joining Mines, Raymond taught at Iowa University (1945–1948) and Fenn College (1946–1949). He worked as a consultant for Coors Porcelain in Golden and the U.S. Navy, and was a research physicist at the Naval Ordnance Laboratory in Washington, DC. Raymond is survived by his wife, Tommie; daughters Molly Blank and Vonnie Ashford; and granddaughter Caitlin.



RICHARD B. HOHLT '47, MS '48 of Victoria, Texas, died January 3, 2013. Born in 1923, Richard began attending Mines in 1940 and enlisted the following year in the U.S. Army

Corps of Engineers, serving three and a half years. He was one of 40 combat engineers from Mines known as the "fair-haired boys." A first lieutenant, Richard served his final year as deputy chief, coal and mining section, Office of Military Government for Bavaria.

After World War II, he returned to Mines—where he was a member of Alpha Tau Omega fraternity—to complete professional and master's degrees in geology. He earned a doctorate in the same discipline in 1977 from Rice University. His career as an exploration geologist included work for Chevron in New Orleans and for several other companies in Houston: Lehman Brothers, San Jacinto Oil and Gas, W. S. Kilroy, Border Exploration and Florida Exploration, as well as several years of independent consulting. He spoke four languages: Spanish, German, French and English.

Richard was predeceased by his wife,

Katherine. He is survived by his children, Richard Hohlt, Mary Walrod and Barbara Ann Hohlt; two grandchildren; and sister Betty Pecore.



ED T. HUNTER '53 of Victor, Colo., died July 7, 2013. Born in 1926, Ed served in the U.S. Army 1944–1946 before earning a professional degree in mining engineering from Mines,

where he was a member of ROTC, Kappa Sigma fraternity and the varsity football team. His career included work in copper, lead and gold underground mines in many positions, including driller, mucker, engineer and manager. He worked for U.S. Smelting, Refining, and Mining for many years, and retired from Cripple Creek and Victor Gold Mining in 1993 as history, culture and permit manager.

In retirement, he volunteered with a number of groups, including the Western Museum of Mining and Industry, where he was former chairman of the board and an honorary life trustee. His interest in preserving mining history and educating the public about its contributions led him to coauthor two books for WMMI—"The World's Greatest Gold Camp" and "A Concise History of Mines Hoisting." Just before his death, he completed his final book, "Cherry's Art: Images of Mining History," a collection of his wife, Cherry's, drawings paired with his own descriptions. Ed received the Rodman Paul Award for outstanding contributions to mining history from the Mining History Association.

Ed was predeceased by his wife. He is survived by his children, Katherine Hunter, Andrew Hunter '76, Nancy Hunter and Elizabeth Hunter-Ball; four granddaughters; and sister Patricia Mitten.



KEITH DOUGLAS JUNG '53 of Mammoth Lakes, Calif., died October 6, 2012. Born in 1928, Doug earned a professional degree in petroleum engineering from Mines, where he was

a member of Sigma Alpha Epsilon fraternity. He earned an MBA from the University of Southern California in 1970. After working in the petroleum industry for 39 years, he retired in 1993. Doug had many interests, including racing sailboats; of his sailing triumphs, he was most proud of winning a national

championship for his class in 1984. He fly-fished around the world and was an accomplished artist, winning several awards in juried exhibitions. Doug was also an alumni admissions representative for Mines.

He is survived by his partner, Brigitte Berman; daughters Lisa Jameson and Heidi Acedo; two granddaughters; and brother Donald Jung.



GEORGE H. KENNEDY of Golden, Colo., died June 7, 2013.

Born in 1936, George joined Mines in 1965 as a professor in the Department of Chemistry and Geochemistry, becoming department head in 1977 until his retirement in 2003. He was awarded Mines' outstanding teacher award in 1992 and served as president of the faculty 1992–1993. George helped guide the department through its transition from a teaching role to one that included research. He was involved with the McBride Tutorial Committee and took sabbatical appointments at the University of the South Pacific in Fiji, The University of Auckland in New Zealand, and the University of Tasmania in Australia. He received a bachelor's degree in chemistry from the University of Oregon and a doctorate from Oregon State University.

George climbed all 54 of Colorado's 14,000+-foot mountain peaks as well as several mountains in Switzerland and New Zealand. He was a SCUBA diver and dove in Fiji and the Great Barrier Reef. He is survived by his wife of 51 years, Kay, and children Joseph and Jill Kennedy.



RICHARD L. KLEBE '51 of The Villages, Fla., died March 9, 2013. Born in 1928, Dick spent one year at Eau Claire State College in Wisconsin before attending

Mines, where he earned a professional degree in metallurgical engineering. At Mines, he was a member of Alpha Tau Omega fraternity, Blue Key honor society, Sigma Gamma Epsilon, Tau Beta Pi, Scabbard and Blade, and ROTC; he was also a cheerleader. His family relates that he delighted in telling the story of the CU Boulder bell heist.

During the Korean war, Dick served in the U.S. Army Corps of Engineers

(1951–1953), and then worked at the General Electric Aircraft Engine Division in Ohio as an engineer and later a purchasing agent. He also worked for Union Carbide and retired from United Technologies Pratt and Whitney Aircraft Division in Florida, where he was program manager of materials contracts. Throughout his life he served on the local boards of trustees for the YWCA; he was also a member of ASM International. Dick is survived by his wife of 57 years, Gail; children Mark, Susan and Donna; and five grandchildren.



ROBERT J. KNOX '49 of Prospect, Ky., died June 29, 2013. Bob was born in 1925. He served three years in the U.S. Air Force and then earned a professional degree in metallurgical engineering from Mines, where he was a member of Beta Theta Pi fraternity and played baseball. After graduation, Bob began a 39-year career with Alcoa Aluminum, during which time he was responsible for operations of rolling mills, coordinator of plant development and control activity, chief metallurgist, quality assurance manager (in both the U.S. and Europe), and manager of field service. He retired briefly in 1987; a year later Bob took a QA and consultant position with ARCO in Kentucky that lasted 10 years.

He established the Robert J. Knox Endowment Scholarship at Mines. Bob is survived by his wife of 65 years, Rosemary; children Jennifer and Tom; two grandchildren; and one great-grandchild.

He established the Robert J. Knox Endowment Scholarship at Mines. Bob is survived by his wife of 65 years, Rosemary; children Jennifer and Tom; two grandchildren; and one great-grandchild.



GERALD P. NELSON '56 of Sequim, Wash., died May 12, 2013. Born in 1930, Jerry entered the U.S. Navy in 1948 and enrolled at Mines following his discharge. He graduated with a

professional degree in metallurgical engineering and was a member of Kappa Kappa Psi honor society. After graduating, Jerry worked for Alcoa, first in New York and then in Pennsylvania, California and Washington. He enjoyed woodworking, music and boating, and was a member of the President's Council at Mines for several years. His wife, Meredith, predeceased him. He is survived by his children, Cynthia Blank, Valerie Parsons, Stephanie Mantey and David Nelson; and nine grandchildren.



KENT D. PEASLEE '78 of Rolla, Mo., died May 17, 2013. Born in 1956, Kent earned a bachelor's degree in metallurgical engineering from Mines. He worked in the steel industry for 13 years and was general manager of technical services for Bayou Steel.

Kent joined Missouri University of Science and Technology as an assistant professor in 1994—the same year he earned a doctorate from the school—and was promoted to associate professor in 2000 and professor in 2005. He was named a Curators' Teaching Professor of metallurgical engineering in 2006 and became the university's first F. Kenneth Iverson Chair of Steelmaking Technology a year later. That same year, Kent received the Governor's Award for Excellence in Teaching from former Missouri Governor Matt Blunt. He served as president of the Association for Iron and Steel Technology, and was a life member of CSMAA. A month after his death, Missouri S&T announced it would rename its new center for steel manufacturing research in his honor.

Kent is survived by his wife of 36 years, Mary; children Michael Peaslee, Sarah Wiggins and Matthew Peaslee; two granddaughters; parents Don and Verla Peaslee; and sister Sherry Nagel.



THOMAS J. RYAN '53 of Hamden, Conn., died July 30, 2013. Born in 1930, Tom earned a professional degree in metallurgical engineering from Mines, where he was a member of

Sigma Phi Epsilon fraternity. He was a veteran of the U.S. Army and retired as plant manager at PGP Industries – Gerald Metals. He was also a founding member and former president of the Hamden Youth Hockey Association and former president of the Alice Peck School PTA. After retiring, Tom volunteered at The Hospital of St. Raphael and St. Ann's Soup Kitchen. He is survived by his

wife of 55 years, Lee; children Michael Ryan, Karen White, Colleen Riley, Paula Beckman and Bethanne Ryan; eight grandchildren; and sisters Mary Burke and Patrice Scavone.



HOWARD V. SCOTLAND III '84 of Cheyenne, Wyo., died July 11, 2013. Howard was born in 1960. He earned a bachelor's degree in mining engineering from Mines and worked in that

industry for 16 years in positions ranging from underground mine foreman to mine and plant manager. He published articles in mining journals and made presentations to professional mining organizations such as the Society of Mining and Exploration. In 1993, Howard earned a master's degree in environmental engineering from Johns Hopkins University, and in 2003, he earned a law degree from the University of Wyoming. He practiced law in Wyoming, primarily in estate planning, probate and trust administration.

Howard climbed several mountains in North and South America, and had climbed all of Colorado's 14,000+-foot peaks. He was predeceased by his parents, Dorothy Scotland and Howard Scotland Jr. He is survived by his wife, Deborah Broomfield; sister Barbara Scotland; stepmother Judith Scotland; and step-siblings Kristin Danni, Robert McMullen and Carolyn McMullen.



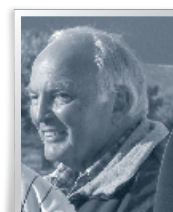
PETER SLUYTER '92 of Austin, Texas, died January 22, 2013. Born in 1968, Peter grew up in South America, Canada, Colorado and Texas. His father

coached his soccer team, the Kingwood Flyers, which toured Europe in 1984. Pete played varsity soccer at Mines, while earning a bachelor's degree in metallurgical engineering; he was also a member of Sigma Alpha Epsilon fraternity. He is survived by his mother, Mary Sluyter; daughters Isabella and Bianca; and sister Karen Hammersley.



DANIEL J. TALLEY '95, MS '97 of Tomball, Texas, died April 22, 2012. Born in 1963, Danny attended Centenary College of Louisiana before earning bachelor's and master's

degrees in geophysical engineering from Mines. He was a geophysicist with Tri-C Resources in Houston and also worked for Chevron North America Exploration and Production in New Orleans. Danny is survived by his wife, Kim; son Daniel; siblings Christopher, Suzie and Sherri; and stepmother Bonnie Talley.



JAMES A. WOOD '63 of Delta, Colo., died July 17, 2013. Born in 1941, Jim earned a professional degree in geophysical engineering from Mines, where he was a member

of ASCSM/student government, Sigma Nu fraternity, Blue Key honor society, and the varsity football team. After graduating, he worked for Texaco, while serving in the U.S. Army's Cold Regions Research and Engineering Laboratory in New Hampshire. Positions with Petro-Lewis, Adobe Resources, and Fina Oil and Chemical followed. He became an independent consultant, a profession he carried to Delta, where he and his wife, Cheryl, moved to be closer to their grandchildren. There he took a job as a real property appraiser in the Delta County Assessor's Office.

Jim was a past president and 50-year continuous member of the Society of Exploration Geophysicists. He is survived by his wife of 47 years; children Don Wood, Tim Wood and Tracey Quist; eight grandchildren; and siblings Linda Ewing, Alyson Lumry and Bob Wood.

—Compiled and edited by
Amie Chitwood and Nancy Webb

ALSO REMEMBERED

ROBERT S. ALLEN '50.....September 11, 2011
HAROLD C. ANDERSON '44.....February 20, 2012
THERON J. BARBOUR '47.....January 19, 2012
FREDERICK H. CAMPBELL '54.....April 6, 2013
DWAYNE M. COLEMAN '49.....April 21, 2012
STEVEN C. COPSEY '72.....May 16, 2009
WILLIAM T. HAMLING '66.....March 12, 2010

L. BRUCE HINTON '68.....October 27, 2010
CHRISTOPHER P. KRUMM MS '09.....November 30, 2012
R. BRUCE MAXWELL '72.....July 7, 2009
THEODORE W. REBECK '53.....February 25, 2009
WENDELL H. SKELTON '43.....February 11, 2013
GREGORY J. STUART '78.....October 8, 2008
JOHN C. YOST '42.....September 4, 2009

AT YOUR SERVICE

Appraisals

ELLIS INTERNATIONAL SERVICES, INC.
Appraisals • Geology • Economics
www.minevaluation.com
TREVOR R. ELLIS '78
Certified Minerals Appraiser
Mineral Economist



600 Gaylord St.
Denver, CO 80206-3717, USA
Phone: (303) 399-4361
Fax: (303) 399-3151
ellis@minevaluation.com

- Property Valuation
- Geology Reports
- Market Studies
- Economic Evaluation

Consultants



Wright Consulting Company, Inc

John D. Wright, PhD, PE
(CSM '69 & '85) - Chief Engineer


- Property Evaluation
- Reservoir Simulation
- Expert Witness

john.wright@wcoilgas.com
www.wcoilgas.com
+1.720.279.0180



• **Access** • **Excel**
• **Word** • **HTML**
• **PowerPoint**
• **Windows** & **Phone**
• **Camtasia**,...

database

Do you need help? spreadsheet 

Connect to me

Let's build it together

Remote 1-on-1 & Classroom Training

Developer of Mobile & Desktop

Applications ... Forms, Reports,
Charts, Books, Websites, Videos, ...

Crystal Long, PE '83

crystal@msAccessGurus.com

303-335-0727

free books and video tutorials

Access Basics

YouTube.com/LearnAccessByCrystal

AccessMVP.com/strive4peace

Consultants (continued)

Decision Precision®
Training and Assistance in Risk and Economic
Decision Analysis and Project Risk Management
JOHN SCHUYLER
CSM '72 '77 CU '77
(800) 214-3916
(303) 693-0067
fax: 693-2827

CAM, CMA, CMC
PE, CCE, CPIM, PMP

Aurora, Colorado
john@maxvalue.com
http://www.maxvalue.com

HALKER CONSULTING LLC

Specialized Energy Engineering Solutions

9400 Station Street
Suite 300
Lone Tree, CO 80124
303-515-2700

www.halkerconsulting.com
Info@halkerconsulting.com
Careers@halkerconsulting.com

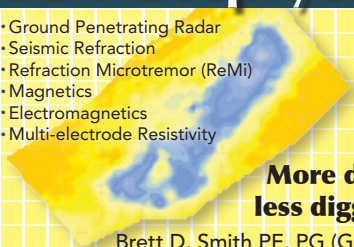
Environmental

ECA Geophysics

- Ground Penetrating Radar
- Seismic Refraction
- Refraction Microtremor (ReMi)
- Magnetics
- Electromagnetics
- Multi-electrode Resistivity

**More data,
less digging**

Brett D. Smith PE, PG (GP '84)
www.ecageophysics.com
(208) 968-9705 (ID) (509) 628-9959 (WA)



Exploration

MARSHALL C. CROUCH III '67

PRESIDENT-GEOLOGICAL ENGINEER
WHITE EAGLE EXPLORATION, INC.

621 17th Street
Suite 2635
Denver, CO 80293

Office: 303-295-2080
Fax: 303-295-2079
Cell: 303-589-4471

E-mail: mcrouch@whiteeagleexploration.com

KiwiEnergy

Mark Gregg
President

markg@kiwienergy.com
Tel 713-266-3820
Fax 281-966-1668
www.kiwienergy.com

KiwiEnergy, Ltd.
5847 San Felipe, Suite 2949
Houston, TX 77057 USA

Exploration (continued)



Exploration Geophysicist
Gravity, Magnetism, Geology
Seismic Interpretation

William C. Pearson, Ph. D.
President

Pearson Technologies, Inc. Phone: 303-989-2014
13424 West Virginia Drive Fax 303-969-9517
Lakewood, CO 80228
pearsontech@comcast.net

Financial

MARKETING AND ECONOMICS

Market Analysis and Strategies
Econometrics
Demand Analysis

Ed Milker (303)753-0675
CSM '71 CSU '74 emilker@cs.com

**Looking for
the right
financial
advisor?**

Cooper Swenson, AAMS®
Financial Advisor

14142 Denver West Parkway
Bldg 51 Ste 170
Lakewood, CO 80401
303-278-0733
www.edwardjones.com

Edward Jones®
MAKING SENSE OF INVESTING

Alumni MS Chem Eng '04 Member SIPC

Geotechnical/Environmental Engineering

A.G. Wassenaar Inc.
Geotechnical and Environmental Consultants

DON TAYLOR, P.E., PRES. 1977
BRIAN GLADE, P.E., VICE PRES., 1979

ESTABLISHED IN 1972, WE
ARE A MULTI-DISCIPLINED
CONSULTING ENGINEERING FIRM
IN THE GEOSCIENCE INDUSTRY
SPECIALIZING IN GEOTECHNICAL
ENGINEERING, MATERIALS TESTING,
CONSTRUCTION OBSERVATION AND
ENVIRONMENTAL SERVICES.

2180 S. IVANHOE ST., SUITE 5
DENVER, CO 80222
303-759-8100
877-696-0826
agwassenaar.com

Machining

D&R CNC Machining Inc.
Quality Parts Since 1996

Small to large production runs

Medical
Food & beverage packaging
Semiconductor
Recreation
Earth Sciences
Energy
Education
Commercial Printing

Darek T. Bruzgo '95, President
darek.bruzgo@dnrdenver.com

Robert Bruzgo '95, Vice President
robert.bruzgo@dnrdenver.com

791 Southpark Dr., Suite 900
Littleton, CO 80120-6402
303.781.2949
303.781.2998 fax
dnrdenver.com

Metallurgical Engineering

FRED R. SCHWARTZBERG, P.E. '53
JOHN N. SCHWARTZBERG, P.E. '88

Rocky Mountain Engineering & Materials
Technology, Inc.

2452 South Trenton Way, Suite C
Denver, Colorado 80231
(303) 306-0660
Fax (303) 306-0990



emtec@RMEMTEC.com
www.RMEMTEC.com

Metallurgical and Forensic Consulting Engineers

Mining

Matheson Mining Consultants, Inc.
VIBRATION CONSULTING

- Seismic Monitoring and Modeling
- Liability Protection
- Public Relations
- Regulatory Compliance
- Seismograph Lease and Sales
- Inspections & Damage Claim Investigations
- Blast Design, Seminars...

www.mathesonmining.com

2801 Youngfield St., Ste. 171 Golden, CO 80401-2266
(303) 456-5638 (303) 456-5639 Fax

Mining (continued)



GROSVENOR ENGINEERING COMPANY

David E. Krebs, EM '66
President

7170 South Franklin Way
Centennial, Colorado 80122
Office (303) 798-0181

Mining & Geological
Consultants
dkrebs@ix.netcom.com

Petroleum

MILLER AND LENTS, LTD.

INTERNATIONAL OIL AND GAS CONSULTANTS

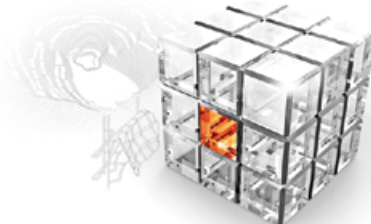
Stephen M. Hamburg
(P.E. '77)

909 Fannin Street, 13th Floor Phone: 713-308-0349
Houston, TX 77010 Fax: 713-654-9914
shamburg@millerandlents.com

Software



To make the right call, you need to see what really lies beneath the surface. MineSight is the software for exploration, modeling, design, scheduling and production: Underground or surface, for the life of your mine.



See The Smarter Solution

MINE SIGHT: THE ESSENTIAL SOFTWARE FOR MINE PRODUCTIVITY

Fred Banfield EM '64, Mintec, Inc. chairman and founder. www.minesight.com

TECHBASE

Engineering Software

- Database Management
- Maps, Cross Sections & Drill Logs
- Modeling & Statistics
- Open-Pit & Seam Mining
- Interactive 3D Visualization
- And more, all in one software package
- Complete Training, Support & Consulting

Michael Norred '78

PO Box 18820, Reno, NV 89511
www.techbase.com - 303-980-5300



SHOW YOUR MINES
PRIDE AND GET MINES
PLATES TODAY!

303.273.3295

ALUMNI ASSOCIATION
COLORADO SCHOOL OF MINES

PERFECT HOLIDAY GIFT!

50% OFF
+ FREE Shipping



Discrete +1.50, +2.00 & +2.50 Magnification Available
in Polarized Brown or Grey w/AR & Front Mirror Coatings

**Polarized Sport &
Polarized Sport Readers**

\$99.99 Retail - Your Price \$50!

Outside Magazine



BRIGHTEN YOUR HOLIDAY!



SINGLE FRAME MODELS

\$54.99 Retail - Your Price \$27.50!

**365-Day Money Back Guarantee
Lifetime Warranty • Rx-able**

XX2i
OPTICS

www.xx2i.com

enter code: **XX5XG5**

on the payment screen during checkout

MINER'S PIC



STARTING OFF STRONG
Student photographer Chelsea Panos captured freshman Allison Loecke in a moment of pride as she headed up Lookout Mountain during this year's M Climb.

MINESALUMNIWEEKEND.COM

All alumni are invited to come home to Mines, where you can reconnect and rediscover your alma mater during three days of Colorado-style fun. This year will feature special programming for the following:

Classes of 1932-1963 — Golden Miners
Class of 1964 — 50th Reunion
Class of 1969 — 45th Reunion
Class of 1974 — 40th Reunion

Class of 1979 — 35th Reunion
Mechanical Engineering alumni
Metallurgical & Materials Engineering alumni

YOUR

» FRIENDS
» CAMPUS
» MEMORIES



WEEKEND

ALUMNI WEEKEND APRIL 24-26, 2014

Colorado School of Mines
Alumni Association
PO Box 1410
Golden CO 80402-1410

NON-PROFIT
ORGANIZATION
U.S. POSTAGE
PAID
Denver, CO
Permit No. 3280

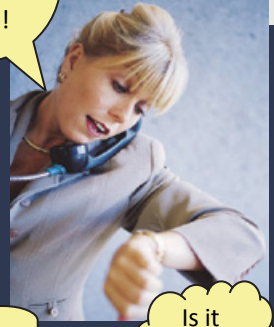
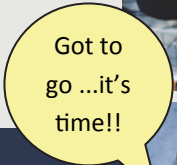
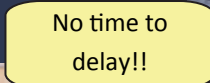
IT'S **TIME** TO GET READY FOR SPRING 2014 RECRUITING

COLORADO SCHOOL OF MINES
SPRING 2014
CAREER DAY
Tuesday, February 11TH

Don't miss out on this opportunity to interact with over 2000 students, graduates, alumni and faculty. register early to choose your booth... and because Career Day will sell out quickly.

Registration Is Now Open!

http://careers.mines.edu/Emp_CD.html



Contact Jean Manning-Clark at 303-273-3239 or jeanmann@mines.edu