

# THE HARD ROCK™

WINTER / SPRING 2018



# THE HARDROCK™

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(More on page 8)

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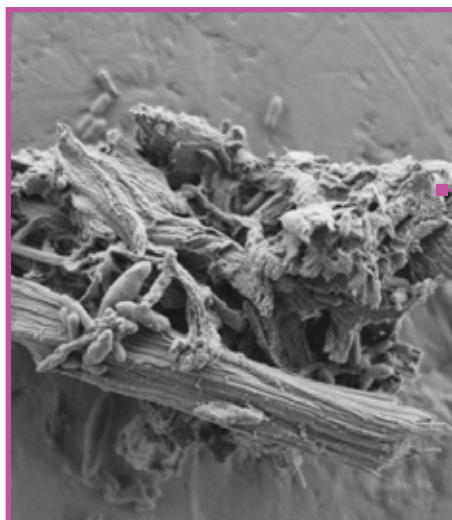
# THE HARDROCK™



Photo courtesy of Michael Dowding



Photo courtesy of Eden Bhatta,



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Greetings fellow Hardrockers and Friends,

Congratulations to fellow SD Mines alumnus Jim Rankin (EE 78) who was named the 19th president of our university. We are thrilled to see an alumnus come home to serve as president; someone with the

understanding of our many campus traditions and strong student expectations to continue our history of educational excellence.

I am very honored and excited to be serving as president of *your* SD Mines Alumni Association! I say "your" because that's truly what it is; a non-profit organization made up of volunteers, to serve alumni, students, and the university. We have alumnus Larry Simonson (EE 69) as our executive director and Sarah Von Eye as our Executive Assistant, both as full-time employees, but the rest of the work is done by volunteers.

The Alumni Association is only as great as we make it, so please get involved, come have fun and join fellow Hardrockers to celebrate our beloved School of Mines! We are starting alumni chapters across the country. We have groups of alumni interested in keeping in touch with each other in various areas, and they are eager to welcome new members. Area chapters are set up to host events and connect alumni with fellow Hardrockers, extending our campus family after graduation. Please contact the Alumni Association office to get involved at 605-394-2347.

I decided to become more actively involved with the Alumni Association in part because I have always had a passion for reunions and Mines events. I went to my first 5-year, all-school reunion as a sophomore in 1995. It was great to meet alumni and connect with them, and at the time, was a real eye opener for future career opportunities and a chance to discuss my education and career path. I haven't missed a reunion since. Mark your calendars for the next one happening July 8-12, 2020. The 5-year, all-school reunions have always been fun and a chance to connect with fellow Hardrockers of all ages!

Cheers!

Gregory "Vetter" Hintgen (EE 99)

2018 President

South Dakota School of Mines & Technology, Alumni Association



Photos courtesy of  
Devereaux Library, SD Mines



## 135 years ago 1883

Rapid Citian John W. Nowlin introduces a bill at the territorial legislators meeting in Yankton, Dakota Territory, establishing the School of Mines. The bill passes by a large majority, but Governor Ordway issues a veto. The Dakota School of Mines is officially founded two years later in 1885.

## 90 years ago 1928

A ceremony for the formal laying of the cornerstone for the new "Physical Training Building" is held. The building is constructed with funds raised through taxes on cigarettes. Many alumni know the building as the "Old Gym." Today, it has been refurbished and serves as the Music Center.

## 55 years ago 1963

The Mineral Industries Building dedication is held in conjunction with the 48th annual meeting of the South Dakota Academy of Science. The meeting is also concurrently held with the North Central Section of the National Association of Geology Teachers. Mr. Paul Zinner gives the principle address at the dedication.

## 30 years ago 1988

Construction begins on the Classroom Building. President Richard Gowen takes part in the groundbreaking ceremony. The building is in the center of campus and houses the humanities, social sciences, and military science departments.



Photo courtesy of  
Eden Bhatta, "December Lights," Sylvan Lake, SD



Dear Hardrocker Friends,

I am very pleased to be writing you as the 19th President of SD Mines. Wendy and I are settling in, and I have enjoyed these first weeks on the job meeting many students, alumni, and faculty. There are some old friends I've been able to reconnect with and many more of you I plan to meet as I continue to represent and promote our alma mater, SD Mines.

The breadth of work and accomplishments that come from our university continue to impress me. In this issue of the *Hardrock*, you will find a small sampling of some incredible achievements: research into the microbes discovered deep inside the Sanford Underground Research Facility that has great potential to advance a broad range of fields from microbiology to environmental engineering; the work of Dr. Tyler Bergstrom (EE 06) who uses the problem-solving skills he developed at Mines in his medical practice as a general surgeon; and the stunning night sky photography of PhD student Eden Bhatta, whose images show off the stark beauty of the Black Hills and Badlands.

The talent pool that has come out of this institution's 133-year history has made a global impact. Mines also continues to make a major impact on the Black Hills economy. The ideas generated here are spinning off into successful high-tech companies and high-paying jobs. B9Creations is a fast-growing company in the Business Development Center on the Mines campus. It employs several students and alumni and is one example of the huge potential for regional tech-sector growth centered around SD Mines. You can read more about B9Creations in this edition.

The future is bright for our students and for this area of the country. I am excited to play a role in boosting the innovation and cutting-edge science and engineering for which SD Mines is celebrated. The best is yet to come.

Warm Regards,

A handwritten signature in black ink that reads "James Rankin". The script is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Jim Rankin, PhD, (EE 78)

President

South Dakota School of Mines & Technology

## Ask the Mines Expert

Rajesh Sani, PhD

Department of Chemical and Biological Engineering



**"Why is diversity important on any scientific or engineering team?"**

It is well established that "diversity" is key to the future of science and engineering. Diversity means "the presence of difference – in any sense."

In the past 11 years, I have personally supervised 68 diverse students and research scientists. They were from India (28), China (1), Nepal (2), Nigeria (3), Malaysia (3), Mexico (1), Taiwan (1), Turkey (2), and USA (27). I learned that diversity in the group brings in not only cultural exchange, but also greatly contributes to research and education. Students from diverse backgrounds come with different skill

sets, knowledge, and practices. We have found that a good blend of team members with diverse backgrounds gives incredible results, which we call synergism in extremophilic microbiology.

Research has no boundaries, and solutions for the investigation cannot be confined to one skill set or paradigm. On the basis of my past experience, I can conclude that greater diversity: 1) offers greater innovation and creativity; 2) generates high-quality solutions in diverse groups; 3) builds diverse ideas, diverse skills, diverse motivation and diverse reactions; 4) improves interpersonal skills of students and increases teamwork; and 5) develops different attitudes and behaviors among students.

In summary, diversity greatly extended my research expertise which includes extremophilic bioprocessing, biocatalysis, biomaterials, gas to liquid fuels, genome editing of extremophiles, homo/heterologous expression of genes, and metabolic engineering. We have one patent, five invention disclosures, and we have published over 60 peer-reviewed articles in high impact journals. I have worked with international collaborators to edit four textbooks. Most importantly, in the past 11 years, my national and international collaborations have resulted in more than \$18 million in funded research.

# Save the Date!

Hardrocker Homecoming Week  
**September 8-15, 2018**

Come home to  
celebrate Rocker Days!



# THE ENGINEER SURGEON

When you think of a general surgeon, an expertise in electrical engineering might not be the first skill that comes to mind. But the engineering education Tyler Bergstrom (EE 06) received at SD Mines helped boost his success in both medical school and as a physician.

“The focus in engineering is problem-solving, and that gives you an advantage in being able to think through complex disease processes or unexpected things in the operating room,” says Bergstrom. “Engineering school is definitely not the easiest path to medicine,” he says with a laugh. “But I’m glad I did it,” he affirms.

Bergstrom grew up in Aberdeen and attended SD Mines right out of high school thanks in part to academic scholarships, including the John T. Vucurevich and Peter Stephans scholarships among others. In his second year at Mines he began volunteering at the local hospital and realized medicine was for him. “I really felt I wanted to help people directly,” says Bergstrom. “Seeing patients and how thankful they were following help from a doctor, that seemed like a very satisfying career.”

He began to take pre-med classes at Mines and continued to pursue his degree in electrical engineering. Following graduation, he attended the University of South Dakota Sanford School of Medicine and then completed his residency in general surgery at the Virginia Mason Medical Center in Seattle, Washington. Following this, he and his wife Sarah, along with their two boys, Matthew and Lucas, chose to come back to the Black Hills to live and work. “We had to travel all

the way to the West Coast to realize the grass isn’t greener,” he says.

In 2016 he joined the surgery department at the Rapid City Medical Center. He is currently the only physician in the area who performs what’s called the “Whipple Procedure,” which can be used to remove part of the pancreas as a treatment for cancer or other ailments. The procedure had not been available to patients in Rapid City for over a decade.

“It’s a difficult surgery,” says Bergstrom. “It can take up to twelve hours to complete. Coming to Rapid City and seeing there was no one else who could do this, I was glad to be able to offer this service to the community,” he says.

Bergstrom enjoys being a surgeon in part because of the satisfaction he receives from helping patients and the community.

“It’s definitely a high-pressure job. You must realize there is a person there. They have a family and they have a life. This is a motivator to do the best job you can.”

Many Mines engineering graduates have gone on to medical school. While engineering may not be what one thinks of as a typical path to the MCAT, medical schools value the critical thinking skills engineering students bring. To help more students who want to pursue a professional healthcare career, Mines introduced Pre-Health Pathways in 2016. This initiative provides resources and guidance for students of any degree to fulfill the requirements for health professional schools.



# FULL CIRCLE

Jim Rankin's Rise to the 19th Presidency of SD Mines

If you're a kid, Dark Canyon is a sublime place to enjoy the summer. Rapid Creek cascades through thick overgrowth and plunges into hidden swimming holes. There are frogs and fish to catch, limestone cliffs and caves to explore, plus ample hiking, biking, and hunting.

"It was a good place to grow up," says Jim Rankin (EE 78). Rankin lived in Draper and attended high school in Fort Pierre, but his family kept a cabin upstream from Rapid City on Dark Canyon Road. "We would go out there just about every weekend," he says.

In high school, Rankin excelled at math and enjoyed attending the West River Math Contest and the science fair each year at the South Dakota School of Mines & Technology. But, a degree in engineering was not on his radar.

"I didn't know what an engineer did when I was a senior in high school," he says. "I wanted to be a math major." One of his friends recommended the School of Mines. Rankin was already familiar with the Black Hills, and so he applied and was readily admitted to the math program at Mines. "I remember being a freshman and wearing a beanie and all the seniors making sure we knew the proper respect," he says. After those first few years at Mines, his interests turned toward electrical engineering, but he didn't spend all of his time with his nose in the books. Rankin played in the pep band for his first two years, and played intramural basketball and other sports. He also took part in professional clubs such as the Institute of Electrical and Electronics Engineers, and earned his pilot's license through the Hardrock Flying Club.

"We spend a lot of time at SD Mines studying, and you need to have some things outside of the classroom that are

fun to do,” says Rankin. “You get to work with other students and you build friendships and relationships that carry on after you leave the school.”

Those extracurricular activities at Mines paired with his engineering degree forged a solid foundation for the rest of his career.

From 1978-1987, Rankin worked as an engineer at Rockwell-Collins in Cedar Rapids, Iowa, on projects tied to the aviation industry, including airborne collision avoidance systems, air transport display systems, and four-dimensional flight management systems. Rankin earned his master’s and doctorate degrees in electrical engineering at Iowa State University. He then worked as a professor at St. Cloud State University in Minnesota from 1989-1997.

In 1997, he accepted a position as the director of an avionics engineering center at Ohio University in Athens. There, he rose to the office of interim vice president for research and served as the associate dean for research and graduate studies in the Russ College of Engineering and Technology.

In 2010, Rankin moved to the University of Arkansas in Fayetteville to serve as vice provost for research and innovation leading a push to turn the ideas generated at the university into businesses. During his seven years in Arkansas, the university generated more than 50 start-up companies and external funding increased significantly to \$103 million annually. Rankin also helped develop the institution’s first strategic plan in research and economic development. He started several new faculty recognition programs and developed an expedited industry contracting process.

Rankin will bring the skills he learned in fostering tech-based economic development in Arkansas to his post at

SD Mines. “Part of it is developing the attitude. If we want to grow companies, we need to be thinking about that from the very beginning,” says Rankin. He says the university, the community, and the emerging tech-sector in the Black Hills have a positive momentum that he hopes to continue.

“Entrepreneurship isn’t for everyone,” he adds. “But we should help foster those who are interested in commercializing intellectual property.”

As a student Rankin used extracurricular activities to distract from work and studying. Today he continues to find a balance between work and play. In his free time, you might find him in the cockpit of an airplane, on the golf course, or on his motorcycle. “I’ve had a motorcycle since I was 14,” he says. At Mines it was a Honda CB 550, today it’s a Harley-Davidson. “We (with his wife Wendy) like to go out in the Black Hills and there will be some good chances to take advantage of the scenic areas,” says Rankin.

He and Wendy have been married for 35 years. She holds a PhD in counselor education

from Ohio University and is active in student engagement and philanthropy. They have three adult children, Kara, Anna, and Daniel and two grandchildren. “We spend a lot of time talking with our kids and grandkids, so family is important,” he says.

For Rankin, becoming the president of SD Mines is a full circle back to his roots. The Black Hills area is a great place to live and for his family to visit, and now there’s a chance he’ll be able to show his grandchildren some of those secret swimming holes and fishing spots in Dark Canyon that he knew so well as a kid.



# AS GOOD AS GOLD

*The Extremophiles of the Sanford Lab*



In 2009 the former Homestake Mine was a dark, wet, and difficult place to conduct research. The deepest mine in North America began filling with water following its closure in 2002. As momentum built to turn the mine into an underground lab, pumps were installed to dewater the flooded shafts and tunnels. As the water receded, Rajesh Sani, PhD, was among the first researchers to enter the deeper sections of the mine.

“We went 5,000 feet deep, for sampling which took a great deal of effort,” says Sani, an associate professor in the Department of Chemical and Biological Engineering at SD Mines.

Sani and his team were not deep underground hunting for precious minerals, they were looking for bugs. “The microbes we found were as good as gold,” he says with a smile.

Extremophiles are microorganisms that live in harsh environments. They have learned to thrive in places like the geothermal vents of the mid-Atlantic rift, the frigid waters of Antarctic lakes, or the veins of hot water found in tiny cracks deep underground. Extremophiles have evolved unique

Underground Research Facility (SURF). Today, the microbes discovered inside SURF are at the center of exciting new research at SD Mines.

### **[The BuG ReMeDEE]**

In 2017, the National Science Foundation (NSF) awarded a \$6 million grant to Sani and his team to study the range of extremophiles that consume methane. The project is named [Building Genome-to-Phenome Infrastructure for Regulating Methane in Deep and Extreme Environments \(BuG ReMeDEE\)](#). This research (pronounced “bug remedy”) is helping scientists better understand the methane cycle in the hot water fissures under Yellowstone National Park and deep inside SURF. The methane cycle is the generation and consumption of methane by various microbes.

Researchers like Saurabh Dhiman, PhD, in the chemical and biological engineering department are also exploring how some of these microbes can be genetically engineered to better convert methane into value-added products or reduce the impact of future methane emissions on the environment. Venkata Gadhamshetty, PhD, civil and environmental engineering department, and Navanietha Rathinam, PhD, chemical and biological engineering department, will be converting methane into biopolymers and electricity using SURF extremophiles. The research could also open doors for new economic development opportunities in industry that can utilize these genetically modified microbes for processing greenhouse gas and converting it to biofuel, biodegradable plastics or electricity.

“This BuG ReMeDEE consortium will garner the world’s attention on the

significance of analyzing the methane regulation in deep subsurface and extreme environments,” says Sani the principal investigator of BuG ReMeDEE.

### **[Converting Plants to Plastic]**

The extremophiles discovered in the Sanford Lab may also be key in building an industrial process that can convert plant matter into low-cost plastics that are renewable and biodegradable.

A team of researchers with the Composite and Nanocomposite Advanced Manufacturing – Biomaterials Center (CNAM), led by David Salem, PhD, at SD Mines believe the Sanford Lab extremophiles hold huge commercial promise.

“The top ten petroleum based polymers make up about a \$500 billion global market,” says Salem. “These biopolymers potentially can cover the whole range of properties of those.”

South Dakota’s Research and Commercialization Council (RCC) through the Governor’s Research Center Program has awarded SD Mines CNAM [\\$1.8 million to develop commercially-viable processes for manufacturing these materials.](#)

### **[Tip of the Microbiome]**

Sani and his team have made multiple trips into the depths of the Sanford Lab in the last decade. Each milligram of mud or water brought back out can yield thousands of microbes. Each trip brings new discoveries and new species and what’s perhaps most exciting are the discoveries yet to come. “We know only about one percent of the microbiome in these areas, 99 percent remains unknown,” says Sani.



characteristics that make them very useful to scientists like Sani. Twelve years after that first trip, the former Homestake Mine is now the Sanford

# BALLOONING

## in the shadow of the moon

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### *SD Mines Students Join NASA Project to Capture Solar Eclipse Data*

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At 10:35 a.m. on August 21, 2017, in a field in front of a small Nebraska Panhandle farmhouse, a team consisting of SD Mines students, Black Hills area high school students, teachers and community members, meticulously followed a set of steps they had practiced many times before. Payloads were carefully secured, batteries checked, and scientific instruments turned on and tested. Soon, helium was coursing through a hose from tanks in the back of a pickup truck into an eight-foot-tall balloon laid out on the soft grass.

Above the desolate cornfields and sandhills of northwestern Nebraska the moon was starting its path across the sun—the arc of its shadow racing across the country toward this team. The Great

American Eclipse was underway.

The South Dakota Solar Eclipse Balloon Team had been working for two years to prepare for this one sliver in time. Their goal—to launch this balloon at the exact moment to loft the payload to an altitude of about 100,000 feet, under the moon's shadow, during two minutes of totality. On board were video cameras, a radiation detector, GPS, and other scientific experiments. This project aimed to capture images and data from the eclipse. The radiation detector would help measure the flux of cosmic rays in the upper atmosphere as the moon obscured the sun. The video cameras would capture the circle of the moon's shadow on the earth. The team designed and built some of the payload, including a special device to stabilize



the video camera. They researched other components, measured every ounce, tested and retested the devices and completed multiple practice launches all to hone their ability to get this one chance right.

Gina Bestgen (ME 17) was the Deputy Project Manager. One of her jobs was to study wind weather patterns to determine the best launch site in the zone of totality. By the morning of August 21, Bestgen had spent the better part of the past 72 hours poring over the data.

“I was going back and reviewing all the calculations and validating them and making sure data were making sense,” says Bestgen. “The predictions that were provided to us were not accurate. They were using a favorable number for the ascent rate that didn’t include the correct weight of our payload,” says Bestgen. She worked up a diagram, laying out the data with various options for the launch location, and met with team members. Forty eight hours before eclipse day, the team made the decision to move the launch site ten miles to the northeast. A scramble ensued to find a new location and inform the media, community and Federal Aviation Administration. Bestgen says it was the trust of her team in each other that led to the right decision. “We would talk all the way around and each give our input

to make a decision like this,” she says.

At 10:45 a.m., launch team members released the balloon to cheers and a collective sigh of relief. Some 50 miles away, at Alliance High School, the ground station team was gathered, along with two vanloads of SD Mines physics students, a dozen local high school students and many community members

and visitors. They live-streamed video and tracked the GPS location of the balloon so they could later retrieve the payload that would parachute to earth after the eclipse.

But for the next 45 minutes, team members could pause and take in the progression of the celestial event playing out above them. In the wide open Sandhills of Nebraska the launch team was able to view the giant shadow of the moon—like a wall of darkness—as it progressed toward them. In the air their balloon was capturing images and data the entire time. For Bestgen, who has spent so much time focused on the balloon project, the experience of totality was surprisingly profound. But, making the experience even more amazing—she believes the team caught a glimpse of the balloon itself during the eclipse.

“While we were viewing the eclipse, there was this little white dot near the ring around the sun,” says Bestgen. “We were astonished to think this was our balloon,” she adds. “The white dot was where the balloon was predicted to be in the sky, it was just reflecting light from the eclipse.” The image is captured on Bestgen’s cell phone video.

Later that afternoon, the chase team successfully recovered the payload. Team members went back to the lab

and shared data with other teams across the country and with NASA. Much of these data are still being analyzed. But [the video](#) and photos from the on-board cameras are the first images ever captured of the [moon’s shadow crossing the Nebraska plains during an eclipse](#).

The South Dakota Solar Eclipse Balloon Team was one of fifty-five teams from across the country that captured video, photos, and data of the total solar eclipse. NASA and the [South Dakota Space Grant Consortium](#) sponsored the SD Mines based project.

Peggy Norris, PhD, Deputy Director of Education and Outreach at the Sanford Underground Research Facility (SURF), led the team. “For a team with no experience in ballooning to successfully collect data from near space during a 2.5 minute window of totality was no mean feat. It required teamwork and careful planning. For me, it was most rewarding to watch a diverse group of individual undergraduates, high school students, teachers, faculty and community members evolve into a cohesive team working together to achieve this goal, solving many problems along the way and learning from each other,” says Norris.

Solar eclipses have spurred changes in history—they have upended naval battles, deposed kings and caused general chaos and mayhem among confused ancient populations. Eclipses have also been the center of intense scientific study, from the ancient Greeks who built machines to compute and predict their timing, to the total eclipse of May 29, 1919, when astronomers measured the sun’s gravitational bending of light in support of Albert Einstein’s general theory of relativity, to this small team of students who launched a balloon from the Nebraska Panhandle to contribute important data to a nationwide study of the Great American Eclipse of 2017.

# THE MATH of the Wild

## The Algorithms of Animal Dispersal

Photo courtesy of [South Dakota Game, Fish and Parks](#)



Around the summer of 2003 in the La Sal Mountains of Utah, mule deer began to turn into zombies. Or, at least they began to act like zombies. They started losing weight, salivated constantly, and began to walk in listless circles. They grew apathetic and then stopped running from humans.

At first only a few sick animals turned up in annual surveys of harvested deer, but the numbers grew. Testing confirmed the fears of wildlife managers, Chronic Wasting Disease or CWD. The

prion disease produces lesions in the brain that change the animals' behavior.

"We call them zombie deer," says Martha Garlick, PhD, SD Mines math professor.

At first CWD shows no symptoms. It progresses over the course of a few years, but once contracted it's always fatal. CWD is highly contagious and it has ravaged deer and elk populations across the American West. Understanding the rate of spread is crucial to stopping any disease.





This is where Garlick's work comes in, she is teamed up with wildlife biologists, mathematicians, and statisticians at Utah State University and Colorado State University. The team is part of a National Science Foundation grant to improve computer models that can help predict how animal populations move.

"I love math anyway, but, it's really cool to actually apply this to something real world. It's exciting to predict things about animal movement that will help wildlife

managers who care for these populations."

Garlick loves to hike and spend time outdoors, but doesn't spend her days chasing deer and elk in the field, rather she relies on the rich data sets accumulated from years of GPS collars that have been fitted to wild animals.

She uses GPS tracking records, combined with

landscape images to build models of how animals travel across various landscapes. Deer, for example, can move at different rates on rocky slopes than they can in thick trees, or open grasslands, or mazes of cedar brush. Researchers use the animal movement data to assign a number to different landscapes. Animals tend to take the easiest path to resources, like green grass and water, and they are often confined by barriers like a fence, a mountain snowline, or a major river. There are many variables to consider

when building the algorithms that can accurately model something so complex. For example, male deer

*"We call them zombie deer"*

move in different patterns than females, so they require some slightly different math.

One of Garlick's favorite parts of the job is seeing students get involved in this research. "It's fun to get undergraduates excited about this work," she says. "In math modeling, it's sometimes difficult to actually make it fit. You try and keep it simple, but putting in the details so that it mirrors what's really going on, this is an exciting challenge."

The models Garlick is developing not only have applications in tracking deer and elk in the mountain west but can also be used to predict the movement of harbor seals in Alaska, or the spread of the wolf populations introduced into places like Yellowstone National Park. As the research continues and the models inch closer to predicting reality, the real-world applications of this work will continue to grow.

# ENGINE

## AN END TO B

BIOMECHANICS OF INTERVERTEBRAL DISCS



There is a good chance you are sitting down right now. It's possible you've been sitting all day, or maybe you've even been sitting every day for the last few decades.

# ERING ACK PAIN

"There is a trend in the 21st century that 80 percent of our jobs require sitting, and it's even more so when you include leisure time," says Marit Johnson (CE 96), a PhD candidate in biomedical engineering at SD Mines.

You may guess that spending all this time in a chair is not so good for your health. In fact, research is now showing prolonged sitting may contribute to lower back pain. "Eighty percent of us will experience back pain in our lifetime," says Johnson. "If your job requires long hours in a chair, back pain can be a real issue."

Johnson's research is focused on the intervertebral discs of the lower back. These discs are in between the vertebrae, or bones, of the spine, and their softer tissue provides cushion and flexibility. They are key components of a healthy and functional spine.

Research shows that intervertebral discs need to exchange fluid to maintain a healthy environment, similar to how our bodies need breathing to exchange carbon dioxide with oxygen for our survival. "Typically, when we wake up in the morning we're taller," says Johnson. At night when we sleep the

discs pull in fluid and they expand. As the day goes on, that fluid gets pushed back to the vertebra again. In this cycle, the discs provide cushion, take in nutrients and discharge waste products. But when discs are injured, this process is disrupted, cushioning is compromised and sitting becomes difficult. "Sitting for people with disc issues is very uncomfortable and can be very painful," says Johnson.

Johnson is exploring the design of a device that could temporarily relieve pressure on the spine while giving the intervertebral discs a chance to "breathe" properly. An ideal device would give the spine a bit of a pull, or traction, while in a sitting posture, and allow a person to continue working with their arms. Johnson is leading testing on a simulation apparatus she designed.

She uses a stadiometer to measure spine height before and after a short period of sitting in traction in order to capture the spinal height changes that result from the discs pulling fluid in. Currently, spinal traction therapy is

available lying down with either manual or mechanical traction, via aquatic vertical hanging or inversion tables. Johnson's research aims to allow this therapy to be made available while sitting. This would give a patient the chance to keep working at a desk while receiving this type of application. She says the focus is on helping those with disc injuries who must sit on the job. It could also potentially slow down the

impacts to discs from prolonged-sitting occupations.

Johnson brings a unique background to this research. After finishing her degree in civil engineering at Mines, she spent a few years in the field and then decided to go back to school to follow a second passion—physical therapy. She has spent 15 years as a physical therapist, and during this time she was constantly thinking about solutions to problems she encountered in patients. "In the back of my head is the engineer, the innovator, and I need to take what I learned at the clinic and develop these ideas. (In order to do this) I need to understand and speak both medicine and engineering," she says about the biomedical engineering field.

Biomedical engineering is

multidisciplinary. "You have to know a little about many areas to pull in people who are experts in various subject matters," she says. Johnson's research at Mines involves backgrounds in biomechanics, industrial engineering, ergonomics, and human factors, including assistance from

the University of South Dakota physical therapy department.

Johnson is now beginning the next phase of her research. She is set to finish her PhD at Mines in the spring of 2019 and if all goes well, her work could turn into a new way to help alleviate lower back pain associated with sitting.



Marit Johnson



# 3D PRINTING POTENTIAL

## Mines Grads Transform a Local Kickstarter into a Global Powerhouse

It started as all great startups do. Hungrily. Humbly. In a garage.

But this isn't the story of a Silicon Valley stroke of luck. It's the story of South Dakota grit, where an idea with elbow grease fanned the flames of the Black Hills tech boom. And where Mines alumni transformed a 3D printing Kickstarter into a global powerhouse, in an industry where the only constant is change.


### IGNITING THE SPARK

From a 10-year run as a B1 bomber pilot to expertise in advanced mathematics, software, and space, a single thread ties together Mike Joyce's eclectic career—a passion for improving lives through technology. In 2012, that pursuit launched a \$500,000 Kickstarter campaign for B9Creations, a 3D printing company. Joyce aimed to create products more affordable and faster than anything on the market.

Two years and a devoted fan base later, [B9Creations](#) was bursting at the seams. In 2014, it moved into the Business Development Center on the SD Mines campus, a move that brought more than much-needed space. Joyce and his son, Matthew, had handled the entire business. But to scale, the model had to change. Joyce needed an operations engineer, badly. And a vast network lay just a stone's throw away.

Thus came Scott Reisenauer (ME 94), an alumnus with over 20 years of global operations experience. Taking the reins as COO, B9Creations became a lean manufacturing machine. Six months later, Shon Anderson came aboard. Anderson brought a track record of growing businesses from \$5M to \$250M+. He became CEO, allowing Joyce to focus his R&D genius on revolutionizing an industry.

Today clearing revenue just south of \$6M with 30 employees, B9Creations boasts thousands of clients in 66 countries worldwide ranging from jewelry and model making to prototyping, manufacturing, healthcare, and higher education.



One key to this success is a focus on creating opportunity for customers and employees. From jobs retained at a manufacturer in Florida who reduced costs with B9Creations' technology to jobs created in European businesses whose growth has been enabled by B9Creations' technology, this company is passionate about opportunity.

## FUELING THE ECONOMIC ENGINE


B9Creations is bringing Black Hills' most treasured resource back to the fold—its talent.

“We are a technology provider competing on a global scale. And we choose to be here, leveraging technology development and this incredible talent pool to create opportunities for South Dakotans,” said Shon Anderson, CEO. “All of our

engineers except for one had to move away after graduation. We brought them back, and we're working to keep others from having to leave in the first place. We have a robust internship program with SD Mines and Black Hills State University. One of our BH State interns rose through the ranks to become head of our global dealer network. Those are success stories, for us, for our employees, and for South Dakota.”

Leveraging South Dakota talent, B9Creations is fueling the local economic development engine, creating high-paying jobs in the heart of the Black Hills. Alongside the wealth of successful companies in the Business Development Center, South Dakota is now rife with opportunity. So much so, a second incubator is in the works, and B9Creations is once again bursting at the seams and looking for a new home for the next phase of its growth.





**T**he lights of Kathmandu obscure most of the stars, so growing up in Nepal, Eden Bhatta never saw the Milky Way.

In 2015, he and his wife were driving through Custer State Park near the Needles Eye in the Black Hills of South Dakota. They pulled over in a small parking lot under the towering rocks, stepped out of the car, and looked up in awe.

“I remember it vividly,” he says. “It was so dark that it was a bit scary at first, but the sky was so gorgeous and inspiring.”

That first look, with the Needles silhouetted against the hazy Milky Way and the sky dotted with millions of stars, had him hooked. He wanted to share the beauty of South Dakota with friends and family back home in Nepal. So, Bhatta dove head first into the art of night sky and landscape photography. A few short years later his images are capturing the attention of a growing number of fans around the world. Bhatta now has more than 26,000 followers on Instagram alone.

“You can capture night sky with a camera in a way you can’t see them with the naked eye” says Bhatta. “It’s a mix of science and art, and I love this challenge.”

Bhatta and his wife, Namita, are both PhD students at SD Mines. She is studying civil & environmental engineering. His work is in biomedical engineering. To photograph the

night sky in remote landscapes, such as Badlands National Park, requires hours of time outdoors. Bhatta uses his time outside in the vast western South Dakota landscape as a way to fuel his hard work back on campus in the lab.

Bhatta’s research focuses on improving the longevity of titanium orthopedic medical implants, such as replacement hips. Bhatta is using a high velocity cold spray process to coat the metal implants with biocomposite materials, comprising biocompatible materials such as hydroxyapatite, a mineral with similar composition to that found in bone. This thin coating allows the surrounding bone tissue to integrate with the titanium implant, making the tissue-implant bond stronger and last much longer.

Their research will keep Bhatta and Namita in South Dakota for at least a few more years. During this time Bhatta hopes to continue to hone his photography skills and take many more night sky and landscape images around the Black Hills and Badlands. His dream is to someday capture the stars back home in Nepal, “Think of the sky at the Everest Base Camp,” he ponders. With any luck Bhatta will see this dream come true. In the meantime we’re all enriched by the images he continues to capture. You can follow his work, and order your own prints through **Facebook @thetaintedtripod** and on **Instagram @thetaintedtripod**, or on the web at **www.thetaintedtripod.com**.



# TO CATCH THE NIGHT SKY

*The photography of SD Mines student **Eden Bhatta***

Photo courtesy of  
Eden Bhatta, "Celestial Celebration," Badlands National Park, SD

# 2017 Distinguished Alumni Awards

Recipients of the 2017 Distinguished Alumni Award join an elite group of South Dakota School of Mines & Technology graduates who have made outstanding contributions in the fields of engineering, science, business, and public service. The Distinguished Alumni Award has been awarded to ninety-seven graduates since its inception in 1998.



**Marty Jackley**  
(EE 92)

has served as South Dakota's attorney general since 2009, and previously served as the United States Attorney for South Dakota. Jackley also served as president

of the National Association of Attorneys General and in 2016 received the Outstanding Attorney General award from his peers. In fall 2017, Jackley began a campaign to run for governor of South Dakota.



**Charles J. "Jerry" Logan** (MinE 83)

spent 31 years serving his country in the United States Navy, rising to the rank of Captain. During his military career, Logan commanded two U.S. Navy submarines—the USS Bremerton and the USS

Michigan. Following his active command service, Logan led the Office of Military Personnel Policy, executing all policies for the Navy's 230,000 active duty personnel. Now retired, Logan leads mountaineering trips in the Olympic and Cascade mountains and volunteers with Olympic Mountain Rescue.



**Diana Peninger**  
(ChE 86)

spent most of her 30-year career in the chemical industry, beginning at Celanese Corporation where she rose to numerous leadership positions. After a brief stint as the global business director

with Chemtura, Peninger returned to Celanese as vice president of a \$2.3 billion business portfolio where she had worldwide responsibility for four global businesses with five manufacturing plants around the world. She serves on the board of directors for C200, the world's premier women's organization of entrepreneur and corporate CEO's and senior executives.



**Jackie Sargent**  
(EE 89)

began her engineering career as an intern at Black Hills Corporation in Rapid City, while still a student at SD Mines. By 2010, she had risen to the position of vice president of power supply

and renewables integration with the company. Sargent then accepted the position of vice president of power supply and market operations with Austin Energy in Texas. Two years later, she took over as general manager/CEO for Platte River Power Authority in Colorado. Last year, she returned to Austin Energy as its general manager/CEO, where she is responsible for a \$1.4 billion budget and 1,720 employees. She also serves on several non-profit boards focused on public power.



**Douglas G. Stalheim**  
(MetE 80)

is one of the world's top experts on American Petroleum Institute line pipe production. Stalheim's clients are located around the

world. Many of the oil and gas transmission pipelines built since 1993 in North America, and several in the world, have had his direct or indirect involvement. In 2010, he was presented the Yanzhao Friendship Award from Hebei Province, Peoples Republic of China, for contributions to the province of Hebei's iron and steel industry.

# IN MEMORIAM

*The names below include those who have passed (based on our database records) in the last 10 years, but whose names have not appeared in a previous Hardrock magazine. Please contact us if you know of any errors in this list. Going forward, it will be helpful if you share information about the passing of alumni you may know. The names below were received by January 2, 2018, and are listed by year of graduation.*

Verne Hodson (CE 32) 1/24/09  
 Emiel Belzer (CE 34) 3/13/13  
 Murlan Corrington (EE 34) 5/1/09  
 George Hatch (CE 36) 11/14/12  
 F. Raymond Versaw (EE 37) 4/20/08  
 John Soma (EE 39) 4/28/10  
 Ernest Thurlow (Geol 39) 7/25/12  
 John Malcolm (MinE 40) 12/15/10  
 Emil Pietz (ChE 40) 3/24/11  
 Lowell Schuknecht (CE 40) 6/27/10  
 Roger Hill (ChE 42) 11/7/14  
 Elmer Tomsha (EE 42) 2/11/12  
 Lewis Beebe (GenE 43) 12/18/08  
 Bernard Hall (GenE 43) 11/13/12  
 James Heymann (MetE 43) 12/17/09  
 Ray Simpson (MetE 43) 8/20/11  
 Mason Sperry (EE 43) 7/1/13  
 Richard Wagner (EE 43) 8/27/08  
 Jerrol Coates (CE 44) 11/3/11  
 Gordon Ingwersen (MetE 44) 3/18/13  
 Gerard Lammers (ChE 44) 8/17/17  
 Dale Long (CE 45) 8/23/15  
 Elwood Strom (MetE 45) 5/19/09  
 Gregory Turner (GeolE 45) 4/18/09  
 Philip Lawler (GenE 47) 11/8/16  
 James Willging (MetE 47) 11/23/11  
 Roland Grosz (GenE 48) 9/26/17  
 Robert Hamilton (MinE 48) 1/29/08  
 Roger Orvedahl (CE 48) 12/18/13  
 Delbert Bakeman (EE 49) 10/10/17  
 Edwin Brauner (EE 49) 8/19/10  
 Donald Kalda (CE 49) 10/7/16  
 Alfred Kemper (CE 49) 2/21/09  
 Merit Pool (EE 49) 12/31/09  
 Raymond Roby (ME 49) 2/6/17  
 Norman Stout (CE 49) 4/6/09

Morland Tidemann (CE 49) 6/7/17  
 Harlan Van Gerpen (EE 49) 4/4/13  
 Marvin Autio (CE 50) 3/31/08  
 William Beittel (ME 50) 12/11/12  
 Paul Fenske (GeolE 50) 6/14/17  
 Joleroy Gauger (Phys 50) 1/13/17  
 Dean Kurtz (CE 50) 11/26/17  
 Paul Miller (GeolE 50) 4/14/10  
 Stanley Schack (MetE 50) 12/25/08  
 Eugene Stenstadvold (CE 50) 4/12/12  
 Donald Thatcher (Chem 50) 11/29/10  
 Thomas Beckers (GeolE 51) 6/2/15  
 Carroll Hart (GeolE 51) 5/23/12  
 Wayne Kuoppala (ME 51) 2/13/12  
 Earl McCullough (MetE 51) 5/25/17  
 Paul Ness (CE 51) 3/13/08  
 Harold Oban (ME 51) 10/23/16  
 Claude Phillips (MetE 51) 8/16/11  
 Roy Robieson (CE 51) 11/22/14  
 Warren Schipper (GeolE 51) 11/17/13  
 Lennis Shafranek (ChE 51) 9/27/12  
 Donald Turner (EE 51) 4/20/12  
 Albert Gilles (GeolE 52) 3/18/17  
 James Hoskovec (GeolE 52) 10/17/12  
 Fred Propp (ME 52) 11/2/12  
 Melvin Rice (Phys 52) 5/1/12  
 Harold Unger (MinE 52) 7/2/15  
 David Fraser (MinE 53) 1/4/11  
 Wally Larsen (MinE 53) 11/11/17  
 George Scherr (CE 53) 10/29/11  
 Roy Appleby (EE 54) 12/10/13  
 Raymond Burg (ME 54) 1/9/11  
 Floyd Clay (GenE 54) 7/28/11  
 Richard Gergle (ChE 54) 10/20/16  
 Gary Evans (Chem 55) 5/14/09  
 Ed Hubbeling (GenE 55) 9/14/17

Neil Isto (GenE 55) 10/19/09  
 William Parden (EE 55) 7/2/10  
 John Williams (ME 55) 12/9/10  
 Roland Baker (ME 56) 9/29/17  
 James Buck (MetE 56) 6/11/17  
 Norman Harms (GeolE 56) 1/28/09  
 Donald Holmer (Chem 56) 5/9/13  
 Roger Rozendal (GeolE 56) 10/22/08  
 Don Schlegel (EE 56) 10/23/17  
 Sherrill Swenson (MetE 56) 11/1/12  
 Michael Conner (GeolE 57) 10/10/10  
 Botolf Hemre (CE 57) 10/08  
 James Rinehart (Phys 57) 2/9/08  
 Herbert Thomas (ChE 57) 10/25/09  
 Don Ballou (GeolE 58) 7/10/12  
 Stan Barbas (EE 58) 9/29/09  
 Patrick Callan (EE 58) 5/15/16  
 Duane Fish (MS Chem 58) 9/6/13  
 Darwin Hocking (EE 58) 9/29/12  
 John Kuecker (Chem 58) 12/27/11  
 Neil Nerison (ME 58) 11/25/12  
 Bill Reinsmith (ME 58) 7/8/14  
 Donald Reed (MinE 58) 4/28/10  
 Bryce Troyeer (ChE 58) 3/25/09  
 Loren Bemis (EE 59) 8/1/12  
 Denis Dartt (GeolE 59) 10/7/11  
 Duane Gray (EE 59) 10/10/13  
 Thomas Hannan (ME 59) 3/2/09  
 Kenneth Metz (EE 59) 11/20/08  
 George Sherrill (CE 59) 1/9/13  
 Rudolph Trygstad (EE 59) 6/17/12  
 Tommy Vance (CE 59) 3/18/11  
 Dean Davidson (CE 60) 11/30/13  
 Donald Lang (ME 60) 9/28/12  
 George Osborne (CE 60) 9/18/09  
 Jerald Trautman (ChE 60) 5/14/10

Sherman Bollinger (ME 61) 7/2/11  
 Keith Messer (EE 61) 6/8/13  
 Jerry Roland (CE 61) 12/25/10  
 Theodore Andrews (CE 62) 9/10/17  
 Roger Burger (CE 62) 10/15/17  
 James Tobin (ME 62) 10/20/08  
 Jerry Bjornestad (ME 63) 6/6/11  
 Robert Jueneman (Phys 63) 9/13/13  
 Kaare Nodland (CE 63) 1/22/13  
 John Baker (ME 64) 10/6/17  
 George Callaghan (ChE 64) 10/28/17  
 David Goebel (EE 64) 3/8/10  
 John Harsh (MS Geol 64) 1/7/08  
 Ernest Larson (EE 64) 12/23/08  
 Charles Nelson (EE 64) 1/6/13  
 Theodore Adkins (ME 65) 10/20/17  
 Earl Preszler (ME 65) 8/21/17  
 Harlan Scheibe (ME 66) 10/17/13  
 August Bonazzoli (CE 67) 5/8/09  
 James Brooking (ME 67) 9/14/17  
 Robert Eckert (ChE 67) 5/11  
 Bill Fox (ME 67) 5/5/08  
 Lubertus Koster (ME 67) 3/19/13  
 David Pearson (MS GeolE 67) 12/18/13  
 Floyd Rose (EE 67) 3/10/13  
 Ron Schroeder (CE 67) 11/3/09  
 Michael Walawender (MS Geol 67) 9/13/11  
 John Aronson (ChE 68) 5/22/17  
 Phil Boland (ME 68) 9/18/17

Clayton Cameron (EE 68) 2/6/09  
 Kjell Øvreide (ChE 68) 2017  
 Larry Pease (ChE 68) 10/20/17  
 James Ek (MS MetE 69) 10/18/08  
 Allen Horst (EE 69) 11/11/04  
 Francis Kendorski (MinE 69) 12/28/12  
 Richard Chang (MS EE 70) 12/2/10  
 Willard Goodman (CE 70) 7/17/13  
 Michael Higgins (ChE 70) 11/7/14  
 Chia Yi Hsiung (MS EE 70) 1/18/09  
 Ralph Kelley (ME 70) 4/8/11  
 John Rapp (MS Geol 70) 11/25/08  
 Wayne Scheibe (ChE 70) 8/26/09  
 Robert Thomas (MS Phys 70) 5/15/12  
 William Brown (MS Phys 71) 3/10/10  
 George Shea (EE 71) 8/27/17  
 William Talmon (ME 71) 6/30/17  
 Craig Tieszen (ChE 71) 11/22/17  
 Arne Grimstad (CE 72) 9/21/11  
 Chris Huse (ME 72) 6/30/12  
 Tom Varilek (EE 72) 2/25/13  
 Marlin Brendsel (ME 73) 11/17/17  
 Michael Ackerman (EE 74) 5/27/08  
 Ed DeWitt (GeolE 74) 11/1/13  
 Greg Greenfield (EE 74) 4/21/11  
 Theodore Nilssen (MS MinE 74) 4/25/11  
 Roberto Schemel (MetE 74) 1/17/16  
 Tom Walter (CE 74) 12/1/17  
 Warren Stearns (Ex 76) 8/6/17

Charles Summers (MetE 76) 7/10/09  
 Lance Wheeler (MS Phys 76) 4/23/13  
 Ronald Lejeune (MinE 77) 12/13/13  
 Helge Garshol (ME 79) 9/30/12  
 Mike Mahutga (EE 79) 3/17/12  
 Dave Van Goor (ChE 79) 7/27/13  
 Thomas Hanson (Phys 81) 6/22/17  
 Steven Schaffer (Math 81) 5/7/17  
 Greg Schwenk (ChE 81) 4/24/11  
 Kai Knag (CE 82) 12/4/13  
 Dennis Peterson (GeolE 84) 8/27/12  
 Gary Foos (ME 85) 9/5/10  
 John Zollar (GeolE 85) 12/10/08  
 H. Elizabeth Long (MS CE 88) 8/19/12  
 Emmet Quill (CSc 88) 3/16/14  
 Mark Stanczyk (Geol 88) 3/27/13  
 Prakash Punit (MS CE 89) 6/18/11  
 Mark Boland (EE 90) 9/18/17  
 William Smith (ChE 90) 5/28/11  
 Marc Piwko (ChE 92) 6/7/08  
 Douglas Kline (CE 93) 12/10/09  
 Jason Apa (ME 94) 12/15/10  
 Seth Klausen (CSc 07) 12/8/17  
 Adam Maberry (CEng 08) 11/23/08  
 Jordan Christenson (IS 15) 6/30/17

#### Former Faculty/Staff

Jacque Pelkey (ChE Dept) 11/10/17  
 Carl (Al) Grimm (Math Dept) 1/2/18

## 1950's

**Glen (ChE 50)** and **Jo Madsen** moved from Rarity Bay in Vonore, TN, to a retirement community with assisted living and constant care facilities in Maryville, TN. "I turned 89 last year and have been faced with some physical problems, but still enjoy life. We left behind many close friends, but keep in contact with them when we can. I really miss my involvement with golf."

**Jack Goth (MetE 50)** "Things are about the same here in Colorado. We stay busy and I remain a full-time caregiver.

Ree is doing well here at home. This is a number year for us. Ree turned 88 in November, I was 90 in April and we celebrated our 65th anniversary in December. I continue to stay in touch with the mining industry mostly by internet and publications."



**Lowery Smith (GeolE 51)** competed at the recent Senior Games in Birmingham, Ala. "I qualified for the National

Senior Games at the Minnesota Senior Games in racquetball, shot put, discus and javelin for the 85-89 age group. At Mines I threw the shot put, discus and javelin. I placed second in doubles racquetball, third in singles racquetball, fourth in discus, sixth in the shot put and seventh in javelin. My sister and her husband, **Dave Rozendal (CE58)** from Gastrop, Texas, joined Mary Ann and me at the competition." (Lowery is in the green shirt on the right.)

**Keith Graham (Phys 51)** with daughter **Reah Dahl-Stamnes (CE 81)**, and granddaughter Erika Dahl-Stamnes celebrating

birthdays in November in Austin, Texas.



**Forrest Dristy (Chem 53)** "On May 16, Peggy and I became great-grandparents for the first time. Our granddaughter, Christina Farrell Partridge, had her first baby, a beautiful little girl who was named Julia Rose. Although she lives thousands of miles away, we got to see her in person when she was

just 10 days old. On October 28, I was among a group of 84 veterans, mostly of the Korean War, who were whisked away on an Honor Flight from West Palm Beach to Washington, DC. It was a whirlwind, 16-hour trip designed to show us the war-related memorials. We visited Arlington National Cemetery as well as the Air Force memorial and monuments commemorating World War II, and the Korean and Vietnamese conflicts. Along the way we were greeted by enthusiastic crowds of cheering, flag-waving well-wishers. It was a memorable experience to say the least."



**Dan Dake (EE 55)** and son **Tim Dake (ME 81)** sitting on the patio in Reno with the letters "Dake Hall" on the wall of the garage. Tim and Susan just welcomed their first grandchild, Aurora Rose, who was born November 12, in Bergen, Norway, to Jessica Dake Elvevoll and Arne Elvevoll. "That made us great-grandparents for the first time. We hope she will soon get her infant passport so her parents can come back to show her off."

**Bob Annett (ME 56)** is looking forward to the 2020 Reunion, God willing. "Members of my class of 1956 are a vanishing crowd. It's sad for me but that part of life and growing older are

inevitable. I am thankful to be in good health. My wife passed away in 2011 of lung cancer. Since then I have traveled to Europe several times. I am fascinated by the antiquity of that part of the world. It is interesting to me how the Romans got around. They left impressive monuments to their existence. I was in Great Britain in August. The Brits love us, and they are so welcoming. I will continue to travel as long as I am able. May God continue to bless SDSM&T."

**Max P. Gassman (ME 56)** says his SD Mines BS ME degree has served him well. He graduated in 1956 and worked for the John Deere Product Engineering Center in Waterloo, IA, for 30 years. He then worked for the Iowa State ME Department for 25 years. He taught machine design courses and did research on Chipper Shredder machines. His research resulted in US Patent 7070132 low-speed high-torque chipper-shredder machine. Max is now retired in Ames, IA. He and his wife, Gail, have two sons, seven grandchildren, and two great-grandchildren.



**Chas Parks (EE 57)** with his latest restoration project, a 1930 Model A. Chas does each part of the restoration projects himself

from frame up.

**Jim Thompson (CE 57)** "I can't believe that I have been retired since 2000. After living in Des Moines, IA, for more than 45 years, Connie and I sold our home and moved to Florida to be closer to two of our sons and our youngest grandchildren. A daughter and our two oldest grandchildren live in Iowa and another son and granddaughter live in Austin, TX, so we have lots of places to visit. Although I have retired from active competition, we are still involved in hot air ballooning. Our two Florida sons are both balloon pilots and we crew and sometimes fly with them. Our oldest grandson became a third-generation balloonist, getting his pilot's license in 2014 and is carrying on the Thompson competitive activities. I am still very active in the Balloon Federation of America and serve on their committee to select candidates for the United States Ballooning Hall of Fame located in Indianola, IA. One of my fondest ballooning memories was flying in 2012, with my son Jon. We launched from the Stratobowl and flew down the Spring Creek Canyon and landed at the Reptile Gardens. The Black Hills is still my favorite place in the world."

**Jim Bump (CE 57)** has been battling pancreatic cancer since 2013, but after much chemo and surgery the battle is still on. He was back in Rapid City in September for his 65th high school reunion and visited the campus, bookstore and the

alumni office. (Thanks for the homemade jelly). "Welcome back to the Mines incoming president **Jim Rankin (EE 78)**!"

**Hal Nelson (GenE 58)** "I am teaching an introductory engineering mechanics course at a local community college, but will cease that activity at the end of the semester. Hopefully, I will get back to playing a little more golf. Connie has also stopped teaching little tykes at the preschool she helped establish several decades ago. We both volunteer one morning per week at a local hospital. The grandchildren are gradually scattering about the country (Texas, Pennsylvania, and Utah) as they pursue their careers. We have a special interest in watching women's soccer and Philadelphia Eagles football. One granddaughter, Julie, is a professional soccer player for the Chicago Red Stars and is a member of the US Women's National team. She is married to Zach Ertz, a tight-end for the Eagles, who had the Super Bowl 52 winning touchdown reception."



**Ed Tegland (GeolE 59)**, **Chaman Malhotra (GeolE 59)**, and **Landy Stinnett (GeolE 59)** met in Denver, CO., in October.

# 1960s

**Sheldon Roberdeau (GeolE 60)** “After 28 years at our old address in Houston. Hurricane Harvey wiped out most of our house and furnishings, so we elected to move to the hill country around Austin.”

**Bob (CE 61)** and **Becky Miesen** traveled to Albuquerque, NM, for a family wedding and found time to visit with **Larry (CE 61)** and **Kathy Blair** on October 21. Bob said the water from Hurricane Harvey came within 75 feet of their house, but they never lost power or services.

**Jon Spargur (ME 61)** continues to enjoy retirement life in the Raleigh-Durham area of North Carolina, with trips to ocean and mountains. He visited Rapid City in September for his high school reunion. “We explored three areas during three weeks in Spain earlier this year. I tutor fourth graders in math and we take part in several other “clubs” in our Carolina Arbors 55+ community—one of which is the Romeos (retired old men eating out). We also enjoy time with our granddaughter. Jeannie volunteers at RDU airport and at the NC Museum of Art. We were at North Carolina outer banks beach for Thanksgiving with family and at South Carolina beach for Christmas.”

**Ralph Scheinost (ME 61)** retired in 1997, after 32 years at NSP. He worked with **Leon Elliason (ME 62)** for many years at both the Pathfinder and

Monticello nuclear power plants. He is enjoying retirement at a lake home in Crosslake, MN. His eldest son, **Jeff Scheinost (ME 86)** and daughter-in-law **Elizabeth Scheinost (GeolE 86)**, are also Mines graduates.

**Tom Snyder (ME 62)** [Baton Rouge, LA] “I am active and enjoying retirement by playing tennis on Saturday mornings with my tennis group. I also golf on Tuesday and Thursday in the LSU Senior Golf Tournament, in which I am fortunate that somebody developed the golf handicap system for duffers like myself.”

**George O’Clock (EE 62)** has been working on his biomedical engineering MS thesis at the University of Minnesota since 2012 and hopes to receive his degree (6th) in May 2018. He continues working to develop a non-invasive electrotherapy device and protocol for visual disease. At 78, George runs in 5k races, happy to keep his pace under 13 minutes/mile. “In early September, I had a chance to visit with **Jack Mallow (ME 63)** during a 60th High School reunion.”

**Doug Aldrich (ChE 62)** just built and moved into a downsized home (a key criterion was the view!), giving many charitable donations and still unpacking boxes. “Children and grandchildren are all doing their thing, but haven’t convinced any to attend Mines yet. Carolyn and I have been spending three weeks in Europe the past four years: Spain/Portugal, Italy,

Germany and Scandinavia. I am storing up Dramamine for a cruise next year. I have luckily stayed connected to Mines on various facility projects and strategic plans. Can you “seasoned citizens” believe the Chem-ChE building was new in 1957, sixty years ago? I’ve also enjoyed opportunities to serve on several non-profit boards. I wish you well, and remember there’s a difference between life and living.”

**Russ Buyse (EE 63)** “This hasn’t been a good year to be a Bronco fan, but that hasn’t stopped **Randy Parcel (ME67)**, Tracy Kovach, Carolyn and me from having some good times together, however this year not so much at Bronco games. Randy and Tracy hosted a regular get together of Delta Sigs in October at their second home in Las Vegas. All had a good time, notwithstanding individual gaming results. Randy loves his golf and skiing. He has been sidelined because of shoulder issues for the past two years, but is anxiously anticipating the slopes this year. I am very active in my condo association as treasurer and editor of their monthly newsletter. If you want to make a donation to his condo association, I am willing to accept all gratuities!” [Note: Russ and Carolyn live in Florida, but have had Bronco season tickets with Randy and Tracy for many years.]

**Tex Longcor (EE 64)** “After 53 years since graduating, I finally decided to bite the bullet and go part-time. I joined a very good

local company to be Technical Lead over the Army’s Apache Sensors Modernization high performance team.”



**Kent O. Lande (CE 65)** “Wow, 52 years have passed and many rivers have been crossed. I lost my Juanita after 55 1/2 years in December 2012. She had been a stroke survivor for 18 years. I had several assignments in five states between 1965 and 1990. In October 1990, I joined the Louis Berger Group and worked on projects in Pakistan, Philippines, Indonesia, Jamaica, Gaza, Afghanistan, India, South Sudan and Kuwait. In the mid-1990s, I was a co-founder of a contracting firm that performed outcomes-based highway maintenance to several DOTs under fixed price contracts. I finally retired in October 2014, at age 77 ... great career. I have three children and seven grandchildren and have been remarried for three years to Solveig Lande. We currently live in Sioux Falls and travel in our motor home between Minnesota in the summer and Alabama or South Texas in the winter.”

**Loren Anderson (EE 65)** “My daughter Amy had her first child, a boy, on August

20, 2017. Amy turned 37 this October. I was 37 when Amy was born. I still work full-time for Ford Motor in Dearborn, MI."



**Mo Hargens (ME 65)** "Tootie and I have been enjoying our retirement in Rochester, MN, since all our children live in the Rochester area. We celebrate most holidays, birthdays, and special events together. We all went back to my hometown of Miller, SD, for my mother's 100th birthday last August. Pheasant hunting in SD this year with family was pretty slim pickings—only 1 bird per person per day! We have been spending winters in Florida or Texas. This winter we will be in Donna, Texas. We get together with **Jerry Ott (ME 65)** and his wife on a regular basis. Had a great time for our 50th Mines reunion with frat brothers **Gary Nelson (ME 65)**, **Jerry Ott (ME 65)**, and **Ron Uttecht (EE 65)**."

**Terry Gray (ChE 65)** "Well now, after being born/living seven years in Kansas, 17 in South Dakota, 25 in Missouri, two in London, two in the Army (including one in Vietnam), 25 in Ohio, Loma and I are now living in the SOUTH (= Florida). At our youngest of three daughters' request (a nurse wanting to be Daddy

and Mommy's senior citizen caretaker), we are living very near her and her husband in Orange Park, (Jacksonville) Florida! We are still getting settled and still have our Cincinnati (Loveland) house for sale. After a 41-year career, 31 years for Monsanto and the Army, nine for Bayer, one for Lanxess, I retired in February 2006. "

**Herb Reichert (Math 66)** "My wife, Sally, and I went on our third Jay Buckley's Baseball Tour in June 2017; we saw major league games in Atlanta, Tampa Bay, and Miami (and one minor league game). After this tour we have seen games at 21 of the 30 major league teams. Our daughter, Stacy, and her husband, Ryan, are expecting their third boy in February, 2018. After that birth, we will have eight grandchildren (six grandsons and two granddaughters); our oldest granddaughter will be graduating from high school next spring (2018) and our oldest grandson is a high school freshman. Both my wife and I are still enjoying our retirement and don't have any significant health issues, as is true for our entire family. Also, as far as I know, I think I stay out of trouble most of the time."

**Dave Kramer (MetE 66)** "Grandson Andrew Kramer is now attending SD Mines. He is doing well and is considering chemical engineering as his major. Margie and I are enjoying retirement and are looking forward to leaving for Arizona

right after Christmas."



**Larry Mazlack (EE 66)** received his MS in electrical engineering from Mines and managed medical software development for IBM in White Plains, NY. He eventually went back to academics and received a MSc and DSc (computer science: artificial intelligence) from Washington U (Saint Louis) in 1972. This was perhaps the first doctorate awarded in the area of artificial intelligence. Subsequently, Larry taught a variety of AI and database graduate and undergraduate courses at the University of Cincinnati. Contemporaneously, he was a research associate at the University of California, Berkeley, and at the medical school, University of Cincinnati. Larry was also a graduate director and department head at the University of Cincinnati. Larry no longer teaches undergraduate courses. He continues to do research in artificial intelligence and databases; he focuses on Natural Language, Imprecise Reasoning, and Causality Discovery in data. Larry has run with the bulls in Pamplona each and every year since 1974. He is in a red shirt, long blond hair, right side of image.

**Sherry Farwell (Chem 66)** "Since retiring from my academic and professional public-sector endeavors in 2010, I have continued to operate Farwell Land & Livestock Inc., and Farwell Analytical Consulting Services. Judy, my spouse of 54 years, does the accounting work associated with these ongoing family businesses. Our son Gary and his family now live and work in the Rapid City area while our daughter Jodey and her family continue to live and work in Seattle, WA. For the past seven years, I have pursued my intense interest in local western history, with a particular focus on the 1865 Powder River Indian Expedition. This latter project has applied modern analytical science and engineering to the exploration and discovery of previously unknown camp and battle sites associated with the Eastern and Central Divisions of the 1865 military expedition. The project's field work involves exploration on private ranch lands in relatively remote areas of Nebraska, South Dakota, Wyoming and Montana. I have published one paper in the *Journal of the West* that describes the project's initial results."



**Roger Rollins (PHYS 67)** and his wife Barb celebrated their 50th wedding anniversary by taking children and grandchildren on a trip to Alaska. Roger joins his musical wife playing their horns at various functions around South Carolina. Roger is the executive director of the Family and Marriage Coalition of Aiken, Inc., whose mission is to point pre- and post-marriage couples to Jesus as the only way to healthy families.

**Daniel Lipkie (Math 68)** retired from software development in April, 2017. He still lives in the Seattle. Current hobby activity: studying for HAM Extra license (K7NOW).

**Joe Kovarik (MetE 68)** and his wife Shari continue to enjoy retirement, dividing their time between their home in Colorado Springs and visiting their daughter's family in the Atlanta area. Joe recently released a new book entitled "Vanishing Landmarks of Georgia: Gristmills and Covered Bridges." The book chronicles 56 gristmills and 16 covered bridges throughout Georgia. It includes location information, driving directions, a brief history of the mill or bridge, and several photographs of each location. It is available online via Amazon and other book outlets.



**Alan Freiberg (ME 68)** is still flying. He was recently presented a "Master Pilot Award" from the FAA for flying 50 years with no accidents or violations. He is a Commercial and Instrument Rated Pilot with more than 3,000 hours of flight time. After working for Union Oil Co. of California for 25 years and then working as a self-employed consultant for about 15 years, he retired six years ago.

**John Synhorst (EE 68)** is looking forward to seeing more alumni of the Class of '68 next May for the 50th graduation celebration at Mines.



**Paul Axtell (ChE 68)** and **Ron Jeitz (CE 69)** enjoyed pheasant hunting this past October.

**Bruce (ME 69)** and **Karel Seger** have moved to Ruckersville, VA, just outside of Charlottesville. "We are enjoying being near our granddaughters and participating in their school activities. Bruce is volunteering with the Greene County Habitat

for Humanity chapter while Karel is volunteering with a Greene County group which assists low income families with financial needs. We are near the Shenandoah National Park and enjoy the view of the Blue Ridge Mountains."

**Dave Wagner (ChE 69)** traveled from South Carolina back to South Dakota to participate in the 2017 annual "Wagner family" pheasant hunting opener southeast of Alexandria, SD. "It was tough going this year with high winds and fewer pheasants in our area. We managed to shoot a few and missed enough to ensure there will be good population of pheasants next year! There are always a few Mines grads and students who join in on the hunt!"

## 1970s



**Ron Perrone (CE 70)** "On July 6, I retired from Sound Transit as the Deputy Construction Manager for Track. Carolyn and I met with our son Ron Jr. in Memphis, TN. The subject of visiting M Hill came up. We decided to make a family trip to Rapid City on Oct. 6, to see my name on the bronze plaque. This was my first visit to M Hill

in 47 years. The grandkids had a ball finding my name. Sitting on the ground from left to right are grandkids Alex (pointing to my name), Will, and Olivia. Left to right standing are Ron Sr., wife Carolyn, daughter Jennifer, her fiancée Lorenzo, daughter-in-law Jennifer, and son Ron Jr.



**Steve Wider (GeolE 71)** and **Larry Stember (ME 72)**

**Steve Wider (GeolE 71)** recently retired from his physician assistant position with Kaiser Permanente in Riverside, CA, and has more time to golf with **Bob OBrien (ME 72)** and to hike in Las Vegas during a Delta Sig gathering with **Larry Stember (ME 72)**. Steve is also learning to sail and recently spent time sailing in Croatia.



**Al Clark (ChE 71)** "I retired from DOW Chemical last year after 44 years and four days. Now my wife and I spend winters in Florida basking in the sun next to my heated pool

watching my grandchildren play. Life is good.”

**Scott Barber (ChE 71)** “Hello fellow SD Mines alumni. My wife Jan and I are just finishing our 14th year in The Villages in Florida. We moved here after retiring from Dow Corning (now part of Dow/DuPont). We love the consistent sunshine, warm weather, and blue skies of Florida preferring to fly to see the snow when we get the urge, which is not very often. I keep my grey cells from dying off too quickly by providing limited support to my son who manages a remote-control hobby store in Orlando which we started in late 2015. I play a lot of golf and regularly give thanks for my SD Mines chemical engineering degree which enabled me to pursue a successful career and to see much of the world, including the chance to live in Sao Paulo, Brazil, for four years in the mid-‘80s and in Hong Kong for five years until just after its turnover to China in mid-1997. I still get back to Rapid City (my hometown) in June/July of each summer to play golf with old high school and SD Mines friends and to periodically visit the campus. My best wishes to all.”

**Lin (ChE 69) and Barb (Math 70) Seder**



“Our retirement started six and a half years ago, and we find that we are really good at being retired. We love being free to wander the country catching up with friends and family as well as visiting national parks along the way. No RVs for us. Hotels and restaurants do all the cleaning and cooking which works great. We hope to see many of our friends from the class of 1968 at the May 50-year reunion.”

**Craig Scott (Chem 70)** “Mary Lou and I retired in 2015 and moved to Chesapeake, VA, in 2016, to be close to four of our soon to be six grandchildren. We are enjoying life in our 55+ condo community surrounded by recreational opportunities and seemingly endless historical sites and parks ... looking forward to Mines reunions in 2020.”



**Jerry Johnson (ME 70)** “I visited Vietnam for 10 days last spring where I worked on a business plan for a small business owner. The trip was part of the Professional Fellows Program which is funded by the US Department of State and administered by the American Council for International Education. My client owns a tour company featuring the rural areas of northern Vietnam and,

as various home-stays are part of her network, I visited several during the trip. I met the client last fall when she was visiting Boston as part of the same US State Department program to study at the Center for Women and Enterprise where I am a consultant. This was a great opportunity to learn about Vietnamese culture. I have included a picture of some of the people I met and enjoyed.”

**Jerry Wright, (CE 71)** “After retirement from the City of Rapid City in 2010, I served six years on the Rapid City Common Council, retiring from that also on July 3, 2017. Still, not ready to sit in a rocking chair, I returned in 2016 to the SD Mines civil engineering department under the GI Bill ... working toward a PhD in civil engineering, with a dissertation hypothesis of “Irrigation Water Conservation Through the Use of Compost as a Soil Amendment.” This is to find expanded markets for the compost produced by the City of Rapid City. It is a remarkable experience. I am learning how I am repeatedly challenged by the new technology but relying on the basics. I had the opportunity to take classes at Tech and SDSU in seeking this learning experience. It has been a great experience to share time with students a little younger than I and hope to be done by May of 2019, before dementia sets in.”

**Carlos Calderon, Jr. (MS MinE 71)** “I enjoyed a bit of a lull in my activities, which has

been used to visit my clan and grandkids. Three of them are in college now and the other two are either studying or working. I also had knee surgery to repair an ancient soccer injury and am enjoying planning the future ahead. Blessings and have a super 2018. Cheers!!”

**Jerry Davey (ChE 71)** “After working 18 years in Florida, I retired this summer and relocated back to Wisconsin to be close to family and old friends. Arlene and I have done extensive international travel for the past 20 years and plan to continue, both international and in the US”

**Donald Pawlowski (ME72)** has been elected 2018 President of the Nevada Chapter of the American Public Works Association (APWA) by the over 600 Nevada Members. APWA provides advocates and supports the Public Works professionals in local and state agencies as well as the consulting firms that construct and maintain the infrastructure throughout the state of Nevada. “I am currently working as a part-time employee of Atkins, North America living in Reno. I also enjoy the skiing and golf in the Sierra Mountains and keeping up with the grandchildren.”

Greetings from **Kerry (ME 73)** and Pam (Vilhauer) **Belden** in Green Bay, WI. “It's hard to believe that nearly 44 years have passed since we left Mines. Kerry is celebrating his 15th year of retirement from Procter & Gamble Paper

Products and recent retirement from management consulting, while Pam continues to enjoy her directing of one-act plays, coaching of forensics, youth service learning coordinator, and CAS coordinator for the International Baccalaureate Diploma program at Bay Port High School. Our son Brett is leveraging his electrical engineering and computer science degrees as a patent & intellectual properties attorney for Foley & Lardner in Milwaukee. His wife Angela is the Panthers Dance Team coach at UW Milwaukee. On May 28, after 7 years of marriage, Brett and Angela welcomed their son Cruz, our first grandchild. We are enjoying every minute of life and wish the same for all our old friends. GO PACK!!!"



**Dave (ME 73)** and **Bonnie Berg** joined **Tom (ME 70)** and **Sharon Zeller** at the Jimmy Buffet concert at Waikiki, Hawaii, this past November. A great time was had by all Parrot Heads. "We want to invite all area alumni and guests to a no-program, no-agenda lunch the first Thursday of each month at Thirsty's in Rapid City. Catch up with long time alumni friends and hopefully meet and make some new alumni friends."



**Glenn Lambert (ChE 73)** married Jan Overweg in Mitchell on May 20. **Gene (Geol 73)** and **Cindy Wadleigh** were among the guests at the wedding. Glenn was able to witness the total solar eclipse on August 21 at Gene and Cindy's house.

**Steve Clark (ChE 73)** has retired from Dow Chemical after 43 years. "I worked in the Process Control department for most of my career. My wife, Sue Banning Clark, and I have moved to Kalamazoo, MI, to be near our grandchildren."

**Bob Merrill (ChE 73)** "After working most of my post-college career with DuPont, specifically in fibers and polymers, either developing or selling them for the carpet, tire, and apparel markets, I'm currently advising those same producers and users as a director of market insights in chemicals at IHS Markit, one of the leading global market data and analytics companies. My wife and I, and our two adult kids, live in Ohio although my office is in Houston. I still have family in the Rapid City area and do make it back on occasion, most recently in June when I hiked up Cowboy Hill to relive old memories and confirmed my name was still on the plaque! All is well!"

**Wayne Kellogg (GeolE 73)** "I am still working for the

Chickasaw Nation in Ada, OK. I am involved primarily with water planning in a joint effort between the Choctaw and Chickasaw Nations looking at water resources in the 22 counties in southeast Oklahoma. My wife and I are trying to decide what to do for the next chapter of our lives once I decide to retire."

**Bob Heier (ME 73)** "Our state of residence is South Dakota in the little town of Akaska. We enjoy the winter in Covington, LA., just outside New Orleans. We try to stay in contact with Mines graduates and hope to have a reunion in the New Orleans area spring of 2018. We saw **Wally (ME 70)** and **Nancy Sieck** this summer and keep in touch with **Pete Birrenkott (ME 71)** & **Randy Grote (CE 70)**.



**Alan Bergeron (EE 74)** and his wife Liz had a grand time on a 12-day trip to Normandy (France), Bruges (Belgium), Luxembourg, and Strasbourg (France). "Although we enjoyed an abundance of fresh fish and seafood, one of the best meals of the trip was a 4-course dinner, including seared duck breast in Honfleur, France. Wow, it was an amazing meal! The wine selections may have played a

tiny part in the experience. We did a very long day trip to the US sectors of the D-Day invasion area. We organized a private tour conducted by a Scotsman who had moved to France 20+ years ago."



**Bob Morcom (CE 74)** received the PSIA (Professional Ski Instructors of America) Lifetime Membership award. Bob has been skiing since he was a small child and has been a ski instructor for more than 40 years in the Northern Rocky Mountain Division which has smaller ski schools (other than areas like Big Sky, Yellowstone Club, and Bridger Bowl) than the bigger Colorado resorts. "I am amazed at how many SDSMT graduates have also taught at Terry Peak while going to school and then worked at other areas after graduating as part-time instructors while maintaining full-time engineering careers."

**Pat Halley (EE 75)** "I haven't had any interactions with Mines alums since I had a few cold ones with **Mark Olson (EE75)** in San Jose a few months ago. It was great to see him again. On the home front, Sheila and I had our sixth grandchild (and first grandson) on Nov. 28. Also, we will be celebrating our 20th wedding anniversary on January

31. Go Mines!”



**David Knox (ME75)** is enjoying retirement. He manages his own projects these days. **Pat Knox (ChE 76)** works in the natural health field out of sheer love and passion. Together they are active ballroom dancers, avid travelers, and doting grandparents.



**Rusty Gray III (MetE 76)** has been elected to the National Academy of Engineering (NAE). He was cited for “contributions to the understanding of the dynamic and shock-loading deformation and damage response of materials.”

**Richard Wold (ChE 76)** will be retiring from the Rapid City Police Department Evidence Section as a Forensic Chemist after 17 1/2 years of playing (working) with drugs and trying to make our community safe for truth, justice and the American way. “It has been a fantastic career working with drug analysis and subsequent court testimony. You get to

meet the finest people. Looking forward to spoiling my three grandchildren and traveling the U.S.”



**Mark Anderson (Phys 76)** “My wife Hilary and I enjoy living in the mountains just west of Denver, CO. We are living the dream! We spend a lot of time adventuring, hiking, boating, skiing, and traveling. Last year we took two months and circumnavigated the world. The highlight of the trip was trekking in the Himalayas in Nepal to the Annapurna Base Camp. The scenery was magnificent. In the attached photograph we are standing in front of Annapurna, the 10th highest mountain in the world. Next year we will spend a month hiking in the Alps, then down to South America to do some exploring in the Andes and Amazon.”

**Dan Carpenter (CE 76)** “I attended my first and best M Day in 40 years and especially enjoyed spending time with **Rick DeSchepper (EE 76)**, **Chuck Vandever (MinE 77)**, **Bill Keller (ME 71)**, and **Larry Pawlowski (MetE 77)**. I plan to make M-Day an annual event.”

**Kathy Ulman (Chem 76)** “I retired a year ago (December

2016) after 40 years at Dow Corning plus six months as a wholly owned subsidiary of Dow. My primary goal these days is to spend quality time with my family and do a bit of consulting on the side.”



**Dan Speck (MinE 77)**, **Jerry Foster (CE 77)**, **Jim Evans (CE 77)**, **John Schanzenbach (MinE 77)**, **Mike Allibone (MetE 77)**, and **David Hinders (EE 77)** are all proud SD Mines grads class of 1977. Pictured is 240 years of engineering talent at the Deadwood Social Club.

**Bill Betten (Phy/EE 77)** enjoyed returning to campus in October as a member of the University Advisory Board and an Entrepreneur in Residence. “The energy, excitement, and technology demonstrated during our meetings were truly impressive and I look forward to continuing engagement with the faculty and students. As my wife Sue plans to retire from teaching next year, I am launching the next phase of my career, a product development consulting company, Betten Systems Solutions, helping clients define, develop, and commercialize their ideas, with particular emphasis on medical product development. Looking forward to helping the next

generation. Sue, our son Chris (studying graphic arts/industrial design), and I continue to love living in Minnesota and cheering for the Vikings.”



**Robert Quinn (CE 77)** “My son Matthew is a junior at Hill City High School and is attending classes at SD Mines in the afternoon and our daughter Bailey is a sophomore at the University of South Dakota in Vermillion. Pictured is Robert and Bob Horsley, who are partners on the airplane. We both own businesses in Rapid City.”

**President Jim Rankin (EE 78)** and **Gaurdie Banister (MetE 80)** met in Fayetteville, AR, in November. Gaurdie is on the Board of Directors for Tyson Foods.



**President Jim (EE 78)** and Dr. Wendy Rankin met with **Marty Jackley (EE 92)** in Rapid City in December.

**Tom and Bonnie Ochsner (MinE 78)** have moved to

Aberdeen and have been helping relatives with soybean and corn harvest. “We fish once each summer with **Tom White (MetE 76)** and James Pulfrey [son of **Roy Pulfrey (CE 76)**]. We also had a Memorial Day fishing trip with brother **Bob Ochsner (Min E 75)** and **AJ Silva (MinE 76)**. Bob and Sue recently celebrated their 40th wedding anniversary.

**John Chandler (MinE 79)** “Hayley and I are still in the Boulder area and keep busy with work and raising three active kids. My partners and I are still running our small E&P business, Flatirons Resources, and always interested in new opportunities. The shale revolution and all the private equity money in the business has made buying lease acreage difficult with lease bonus costs at historic levels. We did diversify our business model by investing in a midstream business in the active Bakken play in North Dakota. On the SD Mines front, I was privileged to be offered an advisory board position on the geology and geological engineering department as well as the new Energy Resources Initiative program headed by Professor Daniel Soeder. We still have family and friends in the Black Hills, so we get up to visit at least a couple times each year. Hopefully someday my kids will attend Mines and I will be in the Hills even more.”

## 1980s

**Greg Graves (ME 80)** and his wife Deanna retired this year after 37 years at Burns & McDonnell, the last 13 years as the firm’s CEO. They celebrated with three weeks in Hawaii followed by a month in Australia. The rest of 2017 was spent serving several non-profits in Kansas City plus developing their 600-acre ranch south of town.

**Mary Jurczynski LaRonde (ME 80)** “My husband and I are currently living and working in Baku, Azerbaijan. My international teaching gig started in Cairo and led me to Baku. It is an amazing opportunity to live and work in different cultures, share with people globally, and grow into the person I’ve dreamed about.”

**Joni Kachelhoffer (CE 81)** retired on July 3 from the Wyoming Department of Transportation after 27 years. Her husband David is also retiring from the Wyoming Department of Corrections. “It’s been great to have time to catch up with family and friends and do some traveling. We plan to spend more time with our grandkids, who currently live in Maryland. There’s a lot of free time in retirement, too much for me, and I’ve taken a seasonal position as Project Manager for McGarvin-Moberly Construction Company out of Worland, WY. I’m looking forward to new adventures.”

**William McMillan (ME 82)** “I retired at the end of 2014 and moved from Orlando, FL, to Rock Hill, SC. to be near my oldest daughter and her family. My wife and I enjoy traveling to see our grandchildren (seven), great grandchildren (one) and our two daughters who still live in Utica, NY. and Orlando, FL. My wife and I travel each summer back to the Back Hills to see family. I enjoy dropping by the Mines campus and marveling at all the new things. I had my 50-year high school reunion in Burbank, CA and keep busy in retirement by being active in church, Masons, Scottish Rite, bowling, golfing, target pistol shooting and reloading.”

**Kurt O'Bryan (MetE 82)** has accepted a new position as CEO of Potawatomi Business Development Corporation - the Largest Minority Owned Company in Milwaukee. “Daughter **Brooke O'Bryan (MetE 11)** remains with John Deere and is a production manager at John Deere's tractor facility in Waterloo, IA. Retirement is a couple of years away for my wife Linda and me.”



Team Hardrockers in Tuscany – (**Rob CE 81**) and Corinne **Sorge** and **Dave (ChE 81)** and

**Lori [Lien] (CE 81) Litzen.**

**Rich Wells (ChE 82)** was recently promoted to Dow’s vice president of operations for the US Gulf Coast. “In this role, I have responsibility for all of Dow’s manufacturing assets in Alabama, Louisiana and Texas. This is Dow’s largest geographic area with over 6,000 employees. As part of the new job, **Trudy (ChE 84)** and I have returned to South Texas where I spent the first 16 years of my career. We have also lived and worked in the Netherlands and Dow’s headquarters location in Michigan. Trudy works for Third Coast Chemicals as a Business Development Manager. We also recently celebrated the graduation of our oldest son from the U.S. Military Academy in West Point, NY. He is now an Infantry Officer serving in Fort Benning, Ga. Our youngest son is a mechanical engineering student at Michigan Tech.



**Jerry Logan (MinE 83)** retired from the US Navy in 2014, and after consulting for two years has been on something of a sabbatical for the last eight months. “I visited the Mines campus in August during a bicycle ride across South Dakota with my friend Jeff, who rode from Seattle to New York

City over 60 or so days. We spent time at the end of the trip in Sioux Falls with friends, including **Rod Determan (CE 83)**." Pictured: Rod (on the left) and Jerry at Falls Park in Sioux Falls.



**Jay Miller (GeolE 88)** visited **Mike Soukup (ME 82)** in Houston, TX. The weekend was filled with golf, grilling, and catching up on old times.

**Rich Schmidt (CSc 88)** "Dana



and I came back from a four-year stint in the Netherlands in late 2016. We have really enjoyed being back and near our daughter, 26, and son, 22. Our son graduates as an electrical engineer this December, and as he starts his career, I am looking to move to retirement in 2018 after 30 years at Shell. We have enjoyed our travels around Europe, and like to cruise and meet new people in new places. We now live in the Houston area, and are happy to reconnect with folks.



**Chris (MinE 81)** and **Diana Walla** are still living in Cheyenne and "are blessed to have three of our four children living here too! Chris is a manager, Environmental Services for RESPEC. The attached picture is the Winning Team (3rd flight) at this year's Hardrock Golf Classic **Scott Kenner (CE 77)**, **Chris Walla (MinE 81)**, **Joe Corbett (GeolE 82)**, and **Gary Gaulke**.



**Al Goldschmidt (EE 82)** retired and is living a nice peaceful life in Tehachapi, CA, about 125 miles north of the hustle and bustle that is Los Angeles. "I do not miss the traffic at all. My wife, Pam, and I love to travel so we try to spend our summers traveling around the world. This year we were in Europe and next summer we will drive around the country visiting numerous national parks and other scenic spots. Earlier this year we climbed Mt. Kilimanjaro—gotta do these things while you can! All we can say is that retirement is the best.

Both of us volunteer in town so it's not like we are just sitting around watching television!"

**Brian Powers (GeolE 82)** "After 18 years living and working abroad, Marsha and I returned to the US after I suffered a stroke in October 2010. We lived briefly again in Denver before relocating to Ohio in 2012, to help care for Marsha's aging mother. To continue with my stroke recovery, I retired from BP in 2012, after 30 years of service for Amoco and BP. After Marsha's mother passed in 2014, we purchased her parent's retirement home and land in the rolling Appalachian foothills of southern Ohio. We remodeled and updated the home in 2016. We winter in Naples, FL, where we will travel soon to deal with Hurricane Irma damage."

**James Unruh (CE 84)** "I am completing my 17th year with HDR Engineering in Sioux Falls, after spending the first half of my civil engineering career working for another consulting engineering company in Minneapolis. It has been a privilege to work as a senior project manager on the planning and design of multiple complex transportation projects in the Sioux Falls area. I have also worked on many projects in the Twin Cities area, North Dakota, Illinois, and across South Dakota over the years. My wife and I celebrated our 33rd wedding anniversary this summer and our two grown daughters are married and live in the Sioux Falls area. Our son recently completed

his commercial pilot training and just started his career with Envoy, a regional carrier for American Airlines. I continued my running career after track and cross country at SD Mines and ended up running nine marathons including the Mt. Rushmore Marathon twice."

**Lonny Stormo (EE 85)** "After a great career segment at Medtronic, I left in 2015 as one of the founders of a diabetes startup, POPS! Diabetes Care. POPS! Diabetes is a diabetes management service through a digital platform. It has been a great change of pace and change of work to get into startup mode, and we were proud to win the American Diabetes Association Venture to Stop Diabetes Challenge last year. We are based in the Minneapolis area, so, yes, digital health innovation does happen between the coasts! Check us out at [popsdiabetescare.com](http://popsdiabetescare.com)."

**Tim Kroege (MS Geol 85)** "After 23.5 years as a professor of geology at Bemidji State University in Bemidji, MN., I am retiring from the university in December."



**Jaymes Galvin (EE/CSc 87)**, **Doreen Wenzel Shrivastava (CSc 86)**, and **Randy Reynolds (EE 86)** got together during

the Redfield (SD) High School reunion in July.



**Lee (EE 88) and Karen (ChE 88) Swindler** “I retired early from my job as Manufacturing Sr VP and am spending my time consulting and volunteering. Lee and I split our time between our log home in Fort Collins, and our townhome on the water in Houston. Our most exciting news is that we are grandparents! Our daughter, Kara, had our first grandchild, Elliette Ruth, on February 14, and we truly enjoy our time with her and of course, we think she is adorable!”



**Renita Mollman (CE 88)** was the recipient of the 2017 Mujeres del Año Excelencia Award from the Regional Hispanic Institute. The Institute celebrates women leaders in southern California for their outstanding contributions in community leadership in the areas of impact, influence, and inspiration. Renita is a vice president at Burns &

McDonnell, a full-service engineering, architecture, construction, environmental and consulting solutions firm that plans, designs, permits, builds and manages facilities all over the world with one goal in mind: to make clients successful. She manages the Los Angeles, Orange County, and San Diego offices for the employee-owned firm, which is among the top 16 employers on Fortune magazine’s 2017 list of “Best Companies to Work For.” Under her leadership, the offices have expanded work in renewable energy technologies, environmental studies and permitting, facilities design, environmental remediation and electrical transmission and distribution. Mollman, PE, LEED AP, has more than 25 years of experience in design and construction of commercial, industrial, military, and aviation projects.

**Bruce Halter (MetE 89)** “I am still in the aluminum business; however, our company Alcoa split a year ago into an upstream rough materials side and a downstream value-added side. The upstream company is still Alcoa, while the downstream company is new and is called Arconic. We are still producing the same products to the same customers at our plant here at Davenport, IA. We are as busy as ever making aluminum sheet and plate for aerospace, automotive, and industrial applications. I was back in Huron for the South Dakota State Fair and got to see my

mother’s exhibit in the Arts and Education Building where she was sharing her new book about her experience growing up next to Harvey Dunn’s sister Carrie and some of her experiences with Harvey. The book is called, “Shyster and Harvey” and has some interesting stories of her childhood growing up outside of Manchester, SD. plainsman. com/article/memories-of-harvey-dunn-shared-in-book. I was very proud to assist with my nephew, Gabriel Wieczorek, transferring from the University of Nebraska at Kearney (Lopers) to become a SD Mines Hardrocker majoring in physics. He is enjoying it and doing very well.”

**Mark Rantapaa (GeolE 87)** “After 26 1/2 years, my time with Barrick is coming to an end as my wife Cassie and I are ready and eager to look for new challenges. We plan to take a short break from work and do some traveling before getting back into the job market. Our children are doing great. Dylan is in his second year at UNR (mechanical engineering) and Stephanie and her husband Steven have provided us with two beautiful granddaughters, Madeline and Zoey.



Alumni construct a Black Hills Bridge. Pictured L to

R-**Jim Zwijack (MinE 93)**, **Greg Rolland (CE 79)**, **Tom Loomis (GeolE 82)**, **Jay Miller (GeolE 88)**, **Bruce Anderson (CE 79)**, and **Tim Ogdie (ChE 80)** gather after 35-plus years to construct a private access bridge crossing Box Elder Creek in the Black Hills. **Jim Zwijack (MinE 93)** and Susan plan to retire to their dream property in April 2018.

## 1990s

After 10 years in the Tucson area, **Mike Zachmeier (ChE 79)** and **Carla Schanzenbach (ChE 91)** are looking forward to moving back to the Black Hills in the summer of 2018, just in time for their daughter, Micaela, to attend Mines as a freshman in the fall. Their son, Luke, is finishing his freshman year in high school this spring, so he still has a few more years to go. Mike has been active in real estate in Tucson since moving there in 2008, having completed over 250 residential transactions. Carla has had enough of the desert and longs to return to four-season living.



**Joseph Peterlin (MS GeolE 90)** has been feeling much better since his death on 8/11/2015

(see Hardrock Summer 2017 page 31). “My wife, Anne Peterlin, is relieved to no longer be a widow. Since my graduation in 1990, I’ve been working as a professional geologist (PG) and professional engineer (PE) for Parsons Corporation in Cleveland, OH. I have worked in more than 35 states, Puerto Rico, and Canada mainly on environmental projects. My work has allowed me to put into practice all that I learned at SDSM&T. My most recent project involves the management of radioactive hazardous wastes. In addition to my work, I do a couple wilderness canoe/kayaking trips a year, and sometimes long-distance backpacking trips (AT Thru Hike in 2008). And to demonstrate how much better I’m doing since my death, attached is my second selfie ever. It was taken during the August 2017 total solar eclipse.”



Alumni ran the Spartan Sprint at Breckenridge in November. The five-mile race included some grueling obstacles between 9,600-12,000 feet elevation. Left to right in the picture is Leo Nee, **Loren Thomson (IS 94)**, **David Hartmann (CE 94)**, and **Mike Pridgeon (EE 04)**. Mike even ran the 14-mile

Beast course the day before.



Coach Tinker, **Michael Hansen (ME 90)**, and **Thomas Montoya (EE/Phys 87)** after the Western State game.



**Jackie (Dittus) Schroeder (ChE 91)** has enjoyed a wonderful career with 3M Company as a chemical engineer and statistician. She currently works out of the 3M Brookings facility. During her career she has held various engineering roles and completed her MS in applied statistics in 2013. SD Mines prepared her well for each and every opportunity. Not only is she a proud alumna, but also a proud parent of two Mines students. Son Jacob graduates this May with a degree in industrial engineering and daughter Haley is a freshman engineering student.

**Richard Wendland (CE 92)** “Maura and I continue to live blessed lives in Kansas City. Her job as a child psychologist at the University of Kansas Medical Center (Rock Chalk,

Jayhawk!) has no shortage of challenges in today’s world. I spend a fair amount of my time traveling the country working on projects I would have never dreamed of in college. It’s hard to believe I’ll be celebrating my 25th anniversary at Burns & McDonnell in February. What an amazing company and journey. We travel every chance we get and enjoy catching up with classmates. How the years have flown by. A highlight for us this year was traveling to Washington, DC to attend the distinguished retirement ceremony of a dear friend, **Scott Loeschke (ME 92)** from the Navy. Well done, brother! If in Kansas City, we’d love to see you ... if we’re not traveling for a St. Louis Cardinals game.”

**Steven Rieck (ME 93)** recently got a new job assignment as technical lead for combine harvester engine platform at John Deere. He says it is hard to believe it has been 17 years working at John Deere. He also just completed a master’s certificate program for System Engineering at MIT in Cambridge, MA.



**Sheri Soldatke (CE 95)** “We welcomed our third child, Elizabeth, on March 1, 2017. James (4) and Gabriel (3) couldn’t be more excited to be

big brothers. I’m now working on a part-time basis for Parsons on the LAX Landside Access Modernization Program, a \$5.5 billion program which, as part of the Program, will add an automated people mover to the airport in anticipation for the Olympics in 2028.”

**Robb Peterson (IE 96)** “My son, Quaid, is in his second year at Mines. My daughter, Rayleigh, is a freshman and plays volleyball for the Lady Rockers. After 12 years of engineering work at General Motors, and seven more years of operations management positions at Freudenberg and Minnesota Rubber, I have started my own manufacturing company, Glacial Lakes Rubber & Plastics in Watertown. We are four years in and still growing strong. We are one of two suppliers for military boot soles in the country. We also do automotive, industrial, and agriculture parts in rubber and plastics. Jodi and I are enjoying the empty nest and getting to travel a bit more now.”

**Seth Davis (ME 98)** and his wife, Jennifer are expecting the arrival of their first child in May. Seth is currently a pricing manager and has lived and worked for Emerson in Marshalltown, IA, since graduation.

**Marijane White (CEng 99)** “I have obtained a faculty appointment in the library at Oregon Health & Science University, and I am still part of their Ontology Development

research group. My new title and rank are Linked Data Librarian, Assistant Professor.”

## 2000s

### Kevin Millslagle (ChE 00)

“Following graduation, I spent seven years ‘submarining’ on the USS Alexandria. While in the Navy, I earned an MBA from The Ohio State University. After separating from the Navy in 2007, I moved to Nashville with my wife, Amy (ChE 00, University of Tenn). In Nashville, I traded in my TI 85 for a financial calculator and spent five years with an investment banking firm. Currently, I am the chief financial officer for Touchstone Medical Imaging. Touchstone owns/operates 47 medical imaging centers around the country. Amy and I have three beautiful daughters - Kennedy (8), Taylor (6) and Parker (1), who I hope to take on a family trip to the Black Hills in the next couple years.”

**Eric Nelson (MetE 00)** has been the lead in creating a sand reclamation system at Dotson Foundry in Mankato, MN, as the director of operations and technology.

**Karen (Balo) Brady (CE 01)** and her family (husband Mike and three kids) are moving back to Wyoming after 16 wonderful years in Alaska. Karen will continue to work for PDC Engineers remotely. She feels blessed to have that opportunity.

**Herb Kistler (IS 01)** “In 2003, I co-founded the Rushmore Curling Club; the only curling club in western South Dakota. Today, I am club president and handle most of the publicity. We currently have one team of Hardrockers. In the past we’ve had as many as three. We had a free open house December 2. We have coordinated for years with SD Mines to increase the university’s participation. As always, we encourage students and faculty to join us for the greatest game on ice.”



**Dickson Pongrekun (MetE 04)** will be starting his sixth year with Freeport McMoRan and has spent the last 3 1/2 years with their Bagdad AZ, operation as a Senior Metallurgist. His wife, Katie, has been teaching English, grades 9-12, at Bagdad High School. Starting in December of 2017, Dickson will be transferring to Freeport’s Climax operation as Concentrator Operations Superintendent in Leadville, CO. The family is looking forward to this opportunity. His kids, Faith (8) and Michael (6), plan to spend a lot of time skiing, hiking, and camping in the beautiful mountains.



### Matthew Jeschke (CEng 04)

“Some of the best years I have had were at Mines as a student. I’d love to say studying, but perhaps it was the new-found freedom as a young adult. Coursework really paid off though. I could clearly see the advantage Mines gave me in the workplace. I was frequently tasked as an engineer with problem-solving activities that eluded engineers who frankly were much more intelligent than I. Mines really taught me the practical side of engineering though. Over the years I’ve worked on numerous engineering projects for different companies—consulting on implantable medical devices, aerospace R&D, and designing test equipment. I am now a salesman. I find sales is really teaching people how to get what they want.”



**Nick Newell (CEng 04)** and **Jesse Suek (CEng 04)** at 14,264 feet on top of Mt. Wilson in Colorado.



Correction from Summer 2017 Hardrock magazine - **Wes Roth (CSc 04)** entered his 12th year working for US Senator John Thune in Rapid City as his constituent services representative. “My wife, Kim, switched jobs and is now the Western Region Career Development Specialist for the South Dakota Department of Education. We welcomed home our daughter, Elsie, from China in 2015! Both Elsie and her brother Kaleb are thriving!”



Correction from Summer 2017 Hardrock magazine—**Matt Soukup (EE 05)** and his wife have three children, Dina, John, and Joseph. The boys were born premature at 26 weeks gestation. Leap year twins born Feb 29th!

**Craig Grunenfelder (ME 06)** “I was deployed to Puerto Rico with the US Public Health Service in September and stayed for six weeks. We initially were there to support the health care needs of the US Virgin Islands from Hurricane

Irma. We remained on site as Hurricane Maria formed and were the first personnel on the ground immediately after the storm had passed.

**Joy (McClure) Mueller (MetE 07)** and Brian welcomed Brent Jacob Mueller, born on May 12, 2017. Mom and dad are hoping he will be part of the Hardrocker Class of 2039.



**Stacy Watters Langdeau (GeolE 06)** has accepted the position of State Engineer for South Dakota. She and her kids now call Pierre home!

**Rose Luvaas (ChE 08)** "After nine years in Houston, I am being transferred to Champaign, IL, as Operations and Maintenance Manager. The Luvaas' also welcomed their third child, Lane, in September. Everyone will need to get used to the cold again!"



**Sara (ME 08)** and **John Lee** welcomed Margaret Perpetua to their family in September. Brother Jack and sister Emma are happy to be the "big kids"

now. "My husband John and I still live in the Cleveland, OH. area."



**Adam Schulz (CEng 09)** married Lindsay on July 2. He also recently changed jobs and now works for Vantage Point Solutions of Mitchell. Miners attending the wedding included: **Jim (ME 74)** and **Connie Green**, **Josh Green (ME 11)**, **Ashley Fraser (IE 08)**, **Mark (ME 11)** and **Cigi (ME 10) Hughes**, **Chris Bultsma (EE 09)**, **Arlen Schamber (CE 74)**, **Alex Brech (CEng 11)**, **Dale Brech (EE 99)**, **Rob Denind (CEng 97)**, **Adam Freese (CEng 07)**, and **Eric Walz (CSc 05)**.

## 2010s



A group of four SD Mines/RESPEC alumni did the Polar Plunge this past April. The RESPEC team joined with the

Ups of Downs Group. Pictured left to right are **Sam Voegeli (ME 10)**, **Tyler Artz (MinE 15)**, **Kevin Heiberger (ME 07)**, **Pete Rausch (CE 10)**, and Teresa Whitney.



**Ty Murphy (ChE 15)** and **Kati Johnson (ChE 14)** were married in Rapid City on October 14, 2017.



**Sam Papendick (PhD CBE 15)** "Hay Camp Brewing Co relocated this last year to the old Oldsmobile/Cadillac dealership on the corner of 6th and Kansas City Street. We bought the 37,000 square foot building and are transforming it into a multi-use business hub. The brewery scaled up from a 450 square foot tavern to 3200 square feet space with an eight-fold increase in production!"



**Alex Bachwich (ME 15)** and **Jin Kim (ABS 16)** after Lambda Chi's initiation this past spring.



**Patrick Jenkins (ME 15)** married Chloe on October 14, 2017. Patrick is in the center of the photo with Lambda Chi Alpha members in attendance.

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The Kerrville-San Antonio Alumni Chapter met on Sept. 16, 2017 at ‘The Grill’ in Leon Springs (outskirts of San Antonio) to inaugurate the new alumni chapter and to celebrate M Day; **Houston Bashus (MinE 13)** and **Sam Begeman (ME 64)** are serving as co-chairs, and **Clyde Ericsson (MetE 72)** and **Brogan Pappel (ME 14)** volunteered as ‘committee.’ Initially a couple meetings a year are planned. Around 50 alums are in the general surrounding area—and all are invited to attend. Stand by for details. A meal, socializing, and a good time was had by all. Rear (l to r): Alex Pappel, **Brogan Pappel (ME 14)**, **Houston Bashus (MinE 13)**, Linda and **Wayne (CE 73) Grace**, **Laura Schock (ChE 92)**, Louise and **Loren Peters (ME 61)**, Front (l to r): June and **Sam (ME 64) Begeman** and **Clyde Ericsson (MetE 72)**.



Sioux Falls Area Chapter kicked off this summer with an alumni event. One alumnus had not been to a SD Mines alumni event since graduating but had an amazing time and saw old friends he had not seen for 25 years!



In October, Dr. Mike West and Dr. **Jon Kellar (MetE 84)** guided a group of 25 SD Mines students (ME, CEE, CSC, IE and MetE) on a tour of the Nucor Steel facilities in Norfolk, NE. The facilities toured included Nucor's Cold Finish, Vulcraft Division, Detailing Center and Steel Mill. SD Mines alumni helped to give the tour. **Daniel Tiede (ME 11)**, **Jordan Smith (MetE 13)**, **Myriah Santistevan (MetE 15)**, **Bryan Ellefson (MetE 13)**, **Kevin Gray (MetE 11)**, **Derek Nordby (MetE 12)**, **Matthew Hicks (MetE 13)** and **Terry Rasmussem (MetE 91)**.



Delta Sigs gathered in Las Vegas in mid-October.

Front row: **Steve Miller (EE 69)**, **Row Darrow (CE 69)**, **Mark Stoebner (ChE 69)**, **Steve Stahly (Ex 69)**, **Bob Bendick (ME 70)**, **Randy Parcel (MinE 67)**, **Bob Glodowski (MetE 67)**, **Steve Nordaker (ChE 69)**, and **Bill DeGroot (CE 69)**. Back row: **Marty Amble (CE 68)**, **Paul Axtell (ChE 68)**, **Larry Stember (ME 72)**, **Ron Jeitz (CE 69)**, **Dennis Hinders (Chem 67)**, and **Steve Wider (GeolE 71)**.

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This picture was taken after enjoying another great noon shore lunch. Back row: **Les Thiel** (ME 67), **Pete Birrenkott** (ME 71), **Lee Zacharias** (ME 73), **Mike Bates** (EE 70), **Dave Krull** (EX 70), **Jim Brown** (CE 70), Dr Pete Rodman, **Wally Sieck** (ME 70), and **Joe Vig** (CE 71). Front row: **Bob White** (CE 72), Garry Power, Pat Rodman, **Dean Rafferty** (ME70), and Dr Jim Kullbom. All 10 Miners are Triangle Fraternity Brothers.



A group of Theta Tau members have gathered each June for the past 10 years for a weekend of walleye fishing based out of South Whitlock Resort north of Pierre. What started out with a few guys staying at a single cabin has grown to be much bigger with campers, boats, and several cabins. The weekend now starts with about 25 people meeting for a meal on Thursday at Bob's Steak House overlooking Whitlock Bay.



**Kim Haarberg** (MetE 79), **Tom Winkler** (CE 79), **Alan Larson** (ME 79), and **Mark Brown** (ME 79), four Triangles (left to right in the photo) recently got together for their annual boys weekend in Denver for a pheasant hunt and a Broncos game. The pheasants and, unfortunately, the Broncos did not fare well.

# SCHOLARSHIPS @ MINES



925

individual students received  
academic scholarships/fellowships



45 percent

of the student body received  
some form of need-based aid in  
the 2016-17 academic year



173

individual athletic  
scholarships

\$3,421,466



*total scholarships  
in 2016-2017*



Average "GAP"



— \$4,950 —

The "gap" is the amount remaining to cover the full  
cost of attending SD Mines after all financial aid and  
scholarships have been awarded.



22.6%

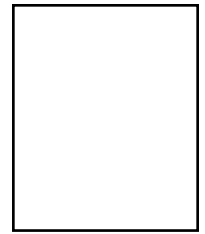
of our student body was Pell-eligible

SOUTH DAKOTA



SCHOOL OF MINES  
& TECHNOLOGY

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SD Mines In-State Tuition Awards =

**\$4000 / yr.  
in savings.**

**Hardrock Heritage Award**

For qualifying students with at least one parent or legal guardian who graduated from SD Mines!

**Colorado Excellence Award**

New freshmen and transfer students from Colorado with a 27 ACT and 3.5 GPA or higher.

**Nebraska Advantage**

New freshmen and transfers from Nebraska are eligible..