

TN

10



5



THE HARDROCK™

The Hardrock™ is published twice a year by the South Dakota School of Mines & Technology. *The Hardrock™* is a trademarked name of the Alumni Association. Submissions of articles and photographs are encouraged. We reserve the right to edit for style, clarity, and content. For information, free subscriptions, or address corrections:

South Dakota School of
Mines & Technology

Office of University Relations
501 E. Saint Joseph St.
Rapid City, SD 57701-3995
605.394.6082
mediarelations@sdsmt.edu
www.sdsmt.edu/hardrock/

Executive Editor
Stephanie Powers

Managing Editor
Fran LeFort

Photography
Brad Blume
Fran LeFort
Dani Mason

Writers
Jade Herman (IS09)
Fran LeFort
Dani Mason

Art Direction
Madison Zimmerman-Dusek

Cover Art
Travis Kowalski

Contributors
Devereaux Library

About the Cover
The chalk images constructing Memorial Arch on *The Hardrock™* cover represent the wide range of Mines students' science and engineering internships in 2015. Read about the artist on page 34.

THE HARDROCK™



18 A RIVALRY FOR THE AGES

The 130th battle for the Homestake Trophy marked SD Mines' rivalry with BHSU as the third oldest in NCAA football history.



22 RISING STARS

Mines students and faculty researchers benefit from the South Dakota Space Grant Consortium's presence on campus.



14 INTERSHIPS WITH IMPACT

SD Mines students aid cancer patients, improve military surveillance, and bring Wi-Fi to the world, all before graduation.



24 TO THE TOP OF THE WORLD

By the time he turned 22, alumnus RC Skull had already conquered what others dare to dream, scaling the tallest peaks of each continent.

2 ALUMNI NETWORK

5 FROM THE PRESIDENT

6 LEGACY NEWS

7 PROFILES

8 CAMPUS INSIDER

12 RESEARCH REVIEW

27 CLASS NOTES

35 AREA MEETINGS

Continue the story at www.sdsmt.edu/hardrockextra

Alumni Association Board of Directors

President
Dave Berg (ME73)

President Elect
Karen Swindler (ChE88)

Immediate Past President
Mike Alley (GeolE73)

Executive Vice President
Tom Zeller (ME70)

Treasurer
Mark Ingalls (CSc92)

Board Members to 2016

Marius Ellingsen (ME00)
William Jones (IE96)
Anne Putnam (ChE05)
Bill Tucker (GeolE56)

Board Members to 2017

Deb Bienert (EE78)
Steve Gassen (IE97)
Matt Goeden (CEng03)
Lacy Pomarleau (CE06)

Board Members to 2018

Denise Barton-Miller (Chem76)
Eric Broughton (EE97)
Shane Lee (MinE10)
Bob Miesen (CE61)

Staff

Assistant Director
Katie Harwood

Alumni Association
Surbeck Center
501 E. Saint Joseph St.
Rapid City, SD 57701-3995
Office: 605.394.2347
alumni@sdsmt.edu
http://alumni.sdsmt.edu



Greetings Alumni and Friends,

It has been a busy fall around campus, and I am honored to be part of it as your 2015-2016 alumni president. I want to thank **Mike Alley** (GeolE73) for his service as 2014-2015 alumni president. I also want to thank outgoing members of the board of directors **Wayne Baumberger** (ME96), **Jason Erikson** (CEng97), **Greg Hintgen** (EE99), and **Abe Kean** (CEng03) for their service. We welcome to the board **Bob Miesen** (CE61), **Eric Broughton** (EE97), **Shane Lee** (MinE10), **Denise Barton-Miller** (Chem76), and president elect **Karen Swindler** (ChE88).

This will be a challenging year for the Alumni Association. After seventeen years as alumni director, **Tim Vottero** (Chem84) is moving on to pursue other endeavors. We wish Tim the best of luck. The board of directors is currently searching to fill the alumni director position. In the meantime, Katie Harwood, assistant director, along with executive vice president **Tom Zeller** (ME70) will keep the business of the Alumni Association running smoothly. You can e-mail Katie at Katie.Harwood@sdsmt.edu or call at 605.394.2347.

It was a busy fall as construction is complete and a dedication was held for the Stephen D. Newlin Family Student Wellness & Recreation Center addition to the King Center. This is a great addition and remodel to the King Center providing more gym, work out, and weight room space. A groundbreaking was held last fall for a new 200-bed dormitory located two blocks west of Surbeck Center to help house our increasing enrollment. A groundbreaking was also held for the renovation of the old chemical engineering/chemistry building to accommodate the fast-growing applied biological sciences program.

We also honored five distinguished alumni at the graduation ceremony in December. I want to congratulate **Karla Callahan** (Chem76), **Dan Carlson** (ChE77), **Mike Ellwein** (ChE61), **Barry Granger** (ChE81), and **Jeff Hohle** (GeolE78) for being chosen to receive the 2015 Distinguished Alumni Awards.

My focus this year is to maintain and expand our connection to SD Mines alumni. One of the best ways to stay connected to Mines and keep in touch with what's happening on campus is to receive the weekly *Hardrock E-News*. The *E-News* provides information on current campus events as well as upcoming area gatherings. If you are not currently receiving the *E-News*, contact Katie at the alumni office.

I look forward to seeing you at Mines area events and connecting with more alumni throughout the next year.

Go Hardrockers!

Dave Berg (ME73)
2016 President
SD Mines Alumni Association

The 1910 Hardrockers football team played on what is known today as Dunham Field. O'Harra Stadium, one of the most unique in America, would be built around it, with the south side featuring ramp parking instead of bleachers. The domed Central States Fairground building in the background still exists today.



100 years ago 1915/1916

Enrollment tops one hundred for the first time during the fall semester. Students celebrate growing enrollment with an impromptu parade through town, ringing the college bell. Campus radio station WCAT begins to send and receive wireless Morse code messages throughout the United States. Mines' Student Army Training Corp recruits travel south with General Pershing to hunt for Mexican renegade Pancho Villa. The Mining Experiment Station, Intramural Program, and campus orchestra are established.

70 years ago 1945/1946

Veterans take advantage of the GI Bill, and the Alumni Association plans for a post-war alumni homecoming celebration. Twenty-five families take advantage of the married student apartments, former military buildings just west of campus. With 210 married male students, the Campus Wives Club is organized. Construction begins on the first dormitory, later named Connolly Hall. Nearly fifty students are moved to Spearfish Normal for their freshman year due to overcrowding on the Mines campus.

50 years ago 1965/1966

Enrollment tops 1,000 for the first time. Female enrollment hits an all-time high with twenty freshman women. Harvey Fraser becomes president. The campus barber charges \$1.55 per haircut. Technology advances: the library gets its first photocopier, a Xerox; forty-eight faculty members attend a digital computer programming course; IBM punch cards are sold on campus; an audio communications system in the museum offers telephones at eight stations, allowing visitors to hear recorded exhibit descriptions.

30 years ago 1985/1986

The Lady Hardrockers volleyball team, football team, and men's basketball team won their SDIC championships. The volleyball team placed second in the NIAA regional tournament hosted at Mines. The first computer programming contest for high school students is held during Engineers Week; the India Club is organized. In December 1985, Roberta Gaines becomes the first female to earn a PhD from SD Mines; she also becomes the 10,000th person to receive a degree from the institution.



This photo was taken during civil engineering junior Nicole Thompson's internship at BNSF Railway last summer.



There are several things that make Mines different, and I would say better, than other universities. Certainly, there are no easy degrees at Mines. As one of our freshmen recently said to his parents, “Other schools might be harder to get in to, but once you are there, it’s not very hard to graduate. At Mines, it is a little less exclusive for admission, but it’s hard to graduate.”

He was right. We expect students to master their craft. We expect hard work, and we haven’t watered down what it means to have a college degree.

Personal attention also distinguishes Mines from many mega-schools where freshmen and sophomores in particular seem to matter little.

But for some alumni who graduated in the immediate post-war era, one of the things that surprises them when they come by to visit is how many of our students have internships or co-ops during their undergraduate education.

Internships provide valuable work experience and allow students to apply what they are learning in the classroom to real-world problems.

One of our students had returned from an internship with a food processor a year ago where he solved a problem on a packaging line. He told me that at first he was afraid he would make a mess of things. Then he just got to work and figured out the problem and fixed the equipment.

But his real insight came later. “After I fixed the equipment, I looked at the operating manuals. What they really had was a training problem. Dr. Wilson, what I learned last summer was that a lot of technical problems aren’t really technical problems; they’re sociological problems.”

Bingo. He learned an important lesson for an engineer.

Internships make engineering real. They give students the chance to experience the culture of different employers and decide what they really like to do.

And internships often lead to employment, either with the company that had them as interns or because of experience they’ve gained. When our students have job interviews and are asked to describe a time when they tried something that didn’t work, or describe a time when they had to motivate a team to work long hours to get a job done, they have real-world experience to draw upon.

Seventy-eight percent of our recent graduates had at least one paid internship or co-op before graduation. That makes us one of the best universities in the nation for internships. Just another point of pride!

Warm Regards,

A handwritten signature in black ink that reads "Heather". The signature is stylized with a large, sweeping 'H' and a cursive 'eather'.

Heather Wilson
President
South Dakota School of Mines & Technology



Preparing For Reentry

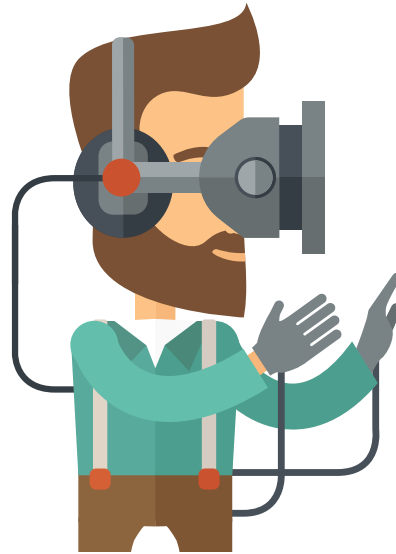
Hurling through space at five miles a second, the International Space Station's microgravity environment gives the illusion of superhuman strength as objects weigh next to nothing. During months of weightlessness, bone density lessens, muscle mass shrinks, and eyeball pressure changes, leaving astronauts ill-equipped for reentry.

Interning under NASA's chief of neuroscience, alumna **Shea Thorson** (IS14) developed a field test to collect data on astronauts' clarity of vision immediately after landing. The tests document a timeline of recovery or readjustment to Earth's gravity to create better training methods and quicker recuperation.

As a scientist at Johnson Space Center's Neuroscience Lab, Thorson analyzed muscle reflex data from bed-rest subjects to mimic and better counter effects of space. She tested astronauts' neurological and sensorimotor performance. Now she's training as a surgical technologist with plans to potentially pursue aerospace medicine.

With NASA astronauts hoping to land on Mars by the 2030s, Thorson's work aims to help get them there and safely back home.

Big Ideas Virtually Change Lives



Alumnus **Nick Newell** (CE04) has this big idea to harness the power of moving pictures to change people's lives.

As senior engineering manager at EchoStar in Denver, Colorado, he holds nearly forty patents. One invention puts broadcast television production in the hands of millions by allowing anybody with a camcorder to publish their home videos on satellite

television. Another memorializes a viewer's experience watching a movie and shares those emotions with family and friends even if they are 2,000 miles away. "Yes, I believe that movies can actually change lives," says Newell, named a 2015 Outstanding Recent Grad.

More than any algorithm, equation, or programming language, Newell says Mines taught him how to be a problem solver, a skill he uses hundreds of times a day. Newell gives back by recruiting at Career Fairs and serving on the electrical and computer engineering Industrial Advisory Board.



Meet Vaughn Vargas

Industrial engineering senior Vaughn Vargas was named a 2015 Native American "40 under 40" by the National Center for American Indian Enterprise Development. Vargas, a member of the Cheyenne River Sioux Tribe, was also named a 2015 Hawkinson Foundation Scholar for his efforts to reduce poverty in Native American communities and enhance relationships between Native and non-Native community members. Last summer he was named the Rapid City Police Department's Cultural Advisory Coordinator. In 2014 he received the prestigious national Udall Scholarship.



Newlin Gift Builds Wellness & Recreation Center

Alumnus **Stephen D. Newlin** (CE75) stood in the new wellness and recreation center last fall and recalled his own experiences as a college student in search of a brief respite from Mines' challenging academics.

"Students today want a lot more than an intellectual education. They want to be well and active, and build relationships. This center provides an opportunity that they haven't had in the past outside of just the classroom," said Newlin, who gave \$2 million to help make the 24,750-square-foot Stephen D. Newlin Family Student Wellness & Recreation Center a reality.

The \$8.9 million center was started by students who voted to tax themselves to fund a bond for the new space. Newlin and others made up the balance of the cost, and the facility opened to the campus community in the fall of 2015. It includes a fitness center, expanded cardio room and weight training areas, locker room, rock bouldering wall, and a two-court Fraser Gymnasium named after former Mines President Harvey Fraser.

It adjoins the King Center on the south end of campus, expanding the university's athletics and

recreational facility to more than 40,000 square feet of new or remodeled space, including the Goodell Gym where the basketball and volleyball teams play.

"When I was a student at the School of Mines, we played basketball and other activities for exercise and fun, building lasting friendships along the way, although we didn't often have a gym available," Newlin said. "Student health and wellness is extremely important and provides the needed balance with academics to create the most impactful overall college experience."

After graduating from SD Mines, Newlin forged a prominent career leading Nalco Chemical Co., Industrial Sector of Ecolab, Inc., and the publicly traded PolyOne Corporation, where he was chairman, president, and chief executive officer of the world's premier provider of specialty polymer materials, services, and solutions.

Newlin has been a major donor to the university over the years, including the Newlin Family Memorial Scholarship endowment in the memory of his deceased wife, Terry.

The Carlsons Pay It Forward



A major gift to SD Mines from **Dan Carlson** (ChE77) and his wife, Nancy, means two to four students a year can turn their attention to the rigorous curriculum instead of incurring heavy debt or work hours.

The Houston couple has been giving with increasing levels for twenty years. Last year their support grew significantly with the creation of the Dan and Nancy Carlson Scholarship Fund, providing full or partial tuition through three different scholarships.

Retired last summer after a career in the oil and gas industry, mostly at Shell Oil, Dan Carlson says it was time to give back. "My experience at Mines equipped me for a successful career, and it was also a place where I formed lasting friendships. Now that we are retired, we want to help create the same opportunity for deserving young students," Carlson says.

The first Carlson-funded recipients will begin receiving support in 2016. Scholarships will range between \$3,000 and \$10,000 per year.

"A scholarship can be the difference that allows a student to attend college or to graduate when money is tight," said Mines President Heather Wilson.

In addition to the scholarship commitment, the Carlsons are providing support for infrastructure on campus, including the new Energy Resources Initiative and the golf and music programs.

"We are impressed with the university's value proposition. SD Mines provides an affordable, high-quality education, where 98 percent of students graduate with a job or plans for graduate school. Investing \$80,000 in a four-year degree that leads to a job at a blue chip company with a starting salary of \$70,000 is a compelling proposition," he says.

Calculus by Day, Heroes by Night



Students Scott Stearns, Michael Schwarz, and Dalton Morgan.

Interspersed among titles such as *Industrial Fire Brigade*, *Structural Firefighting*, and *Fundamentals of Emergency Care* are Rogawski's *Calculus* text, *Fundamentals of Physics*, and *Meteorology for Scientists and Engineers*.

Welcome to the library at Rapid Valley Fire Station, the firehouse home of Mines students and volunteer firefighters Scott Stearns, Dalton Morgan, and Michael Schwarz.

The trio have called the fire station on Highway 44 home since it was built last year. Through a unique new program, the students live on site—with the same housekeeping responsibilities they'd have in their own apartments—and are the first to respond to emergency calls.

"I always had an interest in emergency response and volunteered back home, too. One day Chief (Tim) Kobes pulled me in and told me about this idea. From there we basically built this program from the ground up," says Stearns, an atmospheric and environmental sciences graduate student from Hecla, South Dakota.

The arrangement meets a mutual need. The community has faster response from Mines volunteer firefighters because they live at the firehouse, and the station is managed at night. Students have a place to live, eat, and study when they aren't on campus, as well as gain some valuable real-world experience.

"We encourage our students to serve the community in which we live," said SD Mines President Heather Wilson. "This is a great example of the kind of partnership that makes a difference."

Their roles carry great responsibilities. Firefighters respond to medical emergency calls as well as battle structure and wildland blazes.

Fighting fires inherently carries risks, but one of their scariest calls? "When we received a medical emergency call to a home and ended up having to deliver a baby ourselves," says Schwarz, of Stillwater, Minnesota, who can laugh about it now. "I definitely was not expecting that. When the call first came in I thought maybe she'd already given birth and was having some complications. It's something I will never forget."

The many EMT calls make for a sort of continuous internship for Schwarz, a sophomore majoring in applied biological sciences with a pre-health emphasis, who logged about 250 hours of medical response time last year.

Morgan, a senior civil engineering major from Emerson, Iowa, says his rescue experiences have inspired him to one day try smokejumping in Alaska before ultimately returning for his master's degree.

Bridging the Global Divide

A new Model United Nations group has emerged on campus to help students develop cross-country collaboration and communication skills. Each month, forty-five student members debate real-world problems, developing skills to not only serve the world but shape it along the way.

Founder and sophomore computer engineering student Anneka Swedlund, an American raised in France, is one of an increasing number of globally-minded undergraduates on campus. Swedlund sees her classmates as future leaders whose work will one day be applied in fields from space exploration to defense and multinational corporations, developing the skills today to launch careers all over the world.

New Center Aims to Ensure Student Success

The Student Success Center initiative has been launched to help meet increasing student needs outside the classroom. Physical space and services of the Surbeck Center would be expanded, including co-locating existing campus programs such as the tutoring center, career and professional development, counselors, and advisors, and filling gaps by adding meeting rooms, an enlarged dining area, and a tiered student lounge. A fund-raising goal of \$7.5 million has been set for construction and hiring of an endowed director. Contact the Foundation for potential naming opportunities and other details.

Play Ball, Again



After more than half a century of absence, Hardrocker baseball returned last spring for a six-game season.

Getting the club team into action requires a lot more than just fielding, swinging the bat, and playing games. Locating a regulation-size field, recruiting, fund-raising, and establishing relationships with other local and statewide baseball organizations are key, says president Austin Maus, a mechanical engineering junior who pitches and plays second base for the Hardrocker Baseball Club.

After a 4-1-1 first season against area high schools, the team is eager for the March 19-20 season opener against the University of South Dakota club in Vermillion. The home opener will be April 30 against the South Dakota State University club at Pete Lien Field in Rapid City.

“Club members do not come to school with the intent of playing baseball. What pushes us to continue is really just the love of the game,” Maus says.

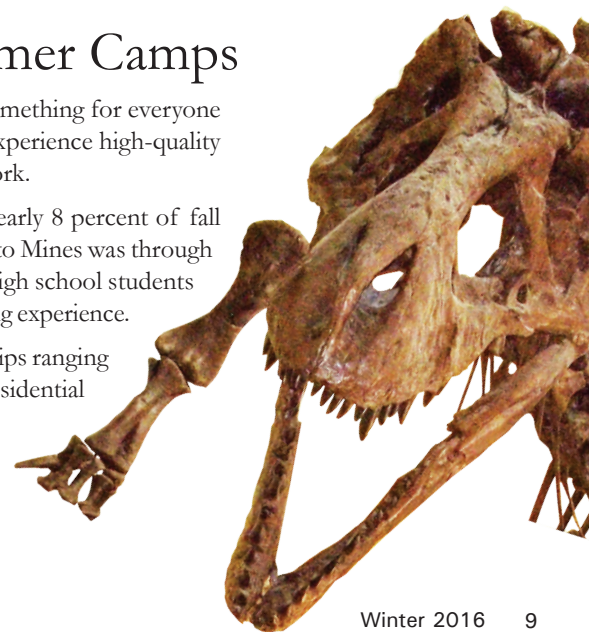
Not Your Ordinary Summer Camps

Chemistry, explosives, 3D printing, fossils. There is something for everyone at this summer's camps, where high school students experience high-quality programming through hands-on activities and fieldwork.

The camps are a front door to a Mines education. Nearly 8 percent of fall 2015 incoming freshmen reported their first exposure to Mines was through a camp. Camps are taught by professors and cater to high school students looking for a fun and challenging science and engineering experience.

Fifty-three full or partial, mostly need-based, scholarships ranging from \$300 to \$975 are available for the week-long residential camps.

“By immersing students in a college setting, they can explore their interests through a unique educational experience,” says Taylor Davis, camps coordinator.



A Fond Farewell

Vottero Says Goodbye After 17 Years Leading Alumni Association

Tim Vottero (Chem84) stepped down from his position as executive director of the South Dakota Mines Alumni Association in December after seventeen years.

After graduating from Mines as a chemistry major, Vottero managed a production lab for a commercial oil field and worked in sales and marketing for a chemical water treatment business and a precious metals refinery before joining the university about twenty years ago. He initially worked as a development officer for the Foundation and was then named alumni director.

As director, Vottero worked with seven university presidents and seventeen alumni presidents and managed events and communications for the university's more than 15,000 living alumni.

"There have been many changes, challenges, and cheers as part of this position. I will leave with the cherished memories of many people, stories, and events, especially the All School Five-Year Reunions and the alumni gatherings across the US," Vottero says.

While some of his favorite memories revolve around the reunions in 2000, 2005, 2010, and 2015, more than anything Vottero has treasured his role as steadfast guardian of Hardrock traditions.

"It's all about the people and the traditions—and being a small part of the incredible legacy left by those who came before us," he says. "As one of only four people who have ever held this position since 1934, my parting wish is that our Alumni Association will survive well into the future so



Tim and Tami Vottero with Tauntaun overlooking Battle Creek in the southern Black Hills.

that generations of alumni to come may learn the value of being a lifelong Hardrock and the importance of tradition."

In the thousands of miles traveled to more than thirty states for alumni events, what's the one thing he shares about Mines to help ensure generations of future Hardrock alumni?

"The heart and soul of any university is its faculty, and we have a long legacy of talented and dedicated professors and instructors. One measure of the value is successful alumni, of which we have had countless numbers throughout the decades."

Unlocking the Secret to a Failsafe Machine



There are systems that operate so seamlessly the alternative is unthinkable until catastrophe strikes, such as a malfunction in an airplane's autopilot or a power plant's autonomous temperature control.

Meet the man with a mission to keep crises at bay: mechanical engineering professor Ali Heydari, PhD. He improves these sensitive systems through intelligent control, a human-inspired method that achieves automation by emulating how people learn through observing outcomes and then modifying behavior accordingly.

The applications are immense, stretching from aerospace to power grids, chemical processes, and economics. Awarded \$312,928 by the National Science Foundation, Heydari will advance new ways to control delicate systems—such as machines that control the flow of anesthesia during surgery—where the consequences of error are catastrophic.

Since intelligent control does not require a perfect model to automate with precision, it offers a superior performance compared to other methods, allowing for real-time adaptation to real-world uncertainties and machines that stop disaster before it strikes.

Ask the Mines Expert

Kyle Caudle, PhD
Mathematics & Computer Science
Assistant Professor

Q: What is meant by Big Data, who's using it, and what are they doing with the information, anyway?

A: If you asked ten statisticians or data scientists how to define Big Data, you would probably get ten different answers. We are entering an era where people are being inundated with large volumes of data, and the need for new methods and individuals to make sense of this data is ever increasing. In fact, more data has been created in the last two years than was created throughout all previous human civilization.

A good working definition of Big Data would be: A data set so large that traditional data analytic methods no longer work. Big Data can be highly organized and easily searched structured data or unorganized unstructured data.

Who's using Big Data? It might be easier to ask who's not using Big Data. Big Data is used by companies and people as diverse as physicists and scientists to business CEOs and NFL general managers. Results of a recent survey of 600 business leaders indicate that 75 percent believe their business is data driven. A data analytics team at Carnival Cruise lines analyzed volumes of data in order to steer its nearly 11 million customers to one of its one hundred ships that would best satisfy their desires.

Here at SD Mines, we are now offering a computational statistics minor. As the Big Data wave continues to roll in, our goal is to equip students with tools that will provide them a competitive edge in today's job market.



WiSE Forges Connections

As she maneuvers her way through Mines' rigorous curriculum, junior Kendra Deziel was quick to adopt the new Women in Science and Engineering (WiSE) Center in the McLaury Building as her go-to place for support and tranquility. The WiSE Center is part of the university's commitment to supporting and mentoring women as they prepare for careers in science, technology, engineering, and math (STEM).

"I come here pretty much every day. It's just really a nice environment. There are others who will help me if I need help with my homework. There are often snacks and fun stuff to do if you just need a mental stress relief," says Deziel, a computer science major from Luck, Wisconsin. "It's one of those things that you don't realize you missed until suddenly it was there."

The university's WiSE efforts began in 2011 as a mentoring program for women students in the mechanical engineering department. Efforts expanded campus wide and evolved into today's WiSE program, which offers an array of professional development and outreach opportunities, industry panelists, study sessions, fun networking events, and a specific mentoring program for first-year students.

Applications for women are increasing, and enrollment of women is inching upwards and increased 8.7 percent in the fall of 2015 compared to the previous fall. Currently, applications from women are up nearly 6 percent for next fall.

"Women have to overcome more barriers than men in STEM fields. Some women have a hard time visualizing themselves in a science or engineering job, and still others don't necessarily have a good picture of what they'd be doing as a scientist or engineer. It's also important that the more strong women role models we can get in front of women students and young girls, the better," says Lisa Carlson, WiSE program director. "Having a physical center is one major component of connecting women students to each other and to female role models. By breaking down barriers and helping to forge connections among students, we end up with a sort of 'sum is greater than equal parts' situation."

Land of Plenty

Growing a Sustainable Living Model in the Reservation Desert

There are 1,700 houses on the Pine Ridge Reservation. On average, seventeen people live in each home. Building material is scarce, land developers scarcer, and with 40 percent below the poverty line, there's little money to spend on food, much less electricity and heat for a home. Insufficient infrastructure means half of the workforce commutes, spending a majority of income on transportation. For the half that remains, the fresh produce available costs more than most can afford—in the only grocery store for 120 miles.

The problem is big.

The vision is greater.

Partnering with Oglala Lakota College (OLC), the Native American Sustainable Housing Initiative, and the Thunder Valley Community Development Corporation, a small group of Mines students and faculty set out to find opportunity in the crosshairs of crises: poverty, energy, housing, and unemployment.

First, they built a greenhouse.

Heated through solar panels, the plastic-covered structure offered students a real-world design lab and residents affordable access to produce. Today, Mines and OLC are working to ensure food can be produced year-round.

The greenhouse helped pave the way for a \$566,698



Photo courtesy of Thunder Valley Development Corporation

National Science Foundation grant awarded to SD Mines for the university's first-ever Engineering Projects in Community Service (EPICS) program. Part of \$1.4 million in recent science, technology, engineering, and math education grants awarded to Mines, EPICS is a program where students design, build, and deploy real systems to solve community problems. Of the twenty-three EPICS universities nationwide, Mines will be the first to partner with a tribal college, and 50 percent of projects will meet critical needs on Pine Ridge.

The first research project led by assistant professor Jennifer Benning, PhD, will implement better heating systems to grow food throughout the winter.

Eventually the Mines team hopes to build greenhouses on each of OLC's nine campuses and begin to turn Pine Ridge's 2 million-acre food desert into a land of plenty.

In addition to making more locally grown food possible, Mines and OLC students have been focusing on low-cost energy.

The Native American Sustainable Housing Initiative, funded by the US Department of Housing & Urban Development, reached out to OLC and Mines with a unique proposition: power a zero-energy home. Earning their photovoltaic installation certificates, Mines Native American students installed solar panels on the roof. The house, built with strawbale

insulation, locally sourced materials, and green building methods, won a national architectural education award.

Benning continues to monitor it for indoor air quality, energy usage, and durability in the unpredictable weather of the plains. Situated next to Thunder Valley's offices, the strawbale house is now the first of over thirty to be built by the inaugural class in Thunder Valley's new workforce development program.

Remaining nimble and responsive, the team hopes to sow the seeds of food sovereignty, sustainability, and economic vitality through engineering projects that meet needs as they arise and empower a community to thrive.



Entrepreneur Aims for RC Tech Boom

Darren Haar has a bold vision. Create 1,000 tech jobs in Rapid City. At the center: Mines, a powerful engine of economic development and the catalyst for job creation.

A former high-level DuPont executive turned Mines entrepreneur, Haar sees a community ripe for change. Last year, jobs in the regional information sector rose 11.1 percent—outpacing tourism three times over.

Add this favorable tech climate to sixteen university invention disclosures and over \$15 million in research in 2015, and the “Tech 1K” pitch was born: “Locate your business minutes away from the brightest minds in engineering and science.”

“Ninety-five percent of the opportunities will come out of the School of Mines,” Haar explains. Those jobs have started arriving. Mines already partners with branches of Fortune 500s like Caterpillar, lean student start-ups, and alumni spinoffs like B9 Creations.

Through a six-month National Science Foundation workshop, Haar

and Joseph Wright, associate vice president for research and economic development, will develop a strategy to launch “Tech 1K.”

Haar’s biggest challenge is Mines’ greatest strength: scientists and engineers who are in high demand. “We need people with experience to come back,” says Haar, himself a Custer native.

To build the infrastructure and opportunity alumni will find attractive takes planning for future growth. That starts with a tech park.

“We’re 33,000 square feet behind in technical business space,” Wright notes, pointing to the full campus incubator and a growing waiting list. “As a community we must embrace a vision of growth to build a facility that reflects that vision.”

They hold up North Carolina State’s Centennial Campus for comparison, a research park with millions in funding from partners like NOAA and the US Forest Service.

Mines has an advantage with the Rushmore Region’s amenities and quality of life. As Haar sees it, tourism and tech tie together, offering booming careers in a beautiful place.



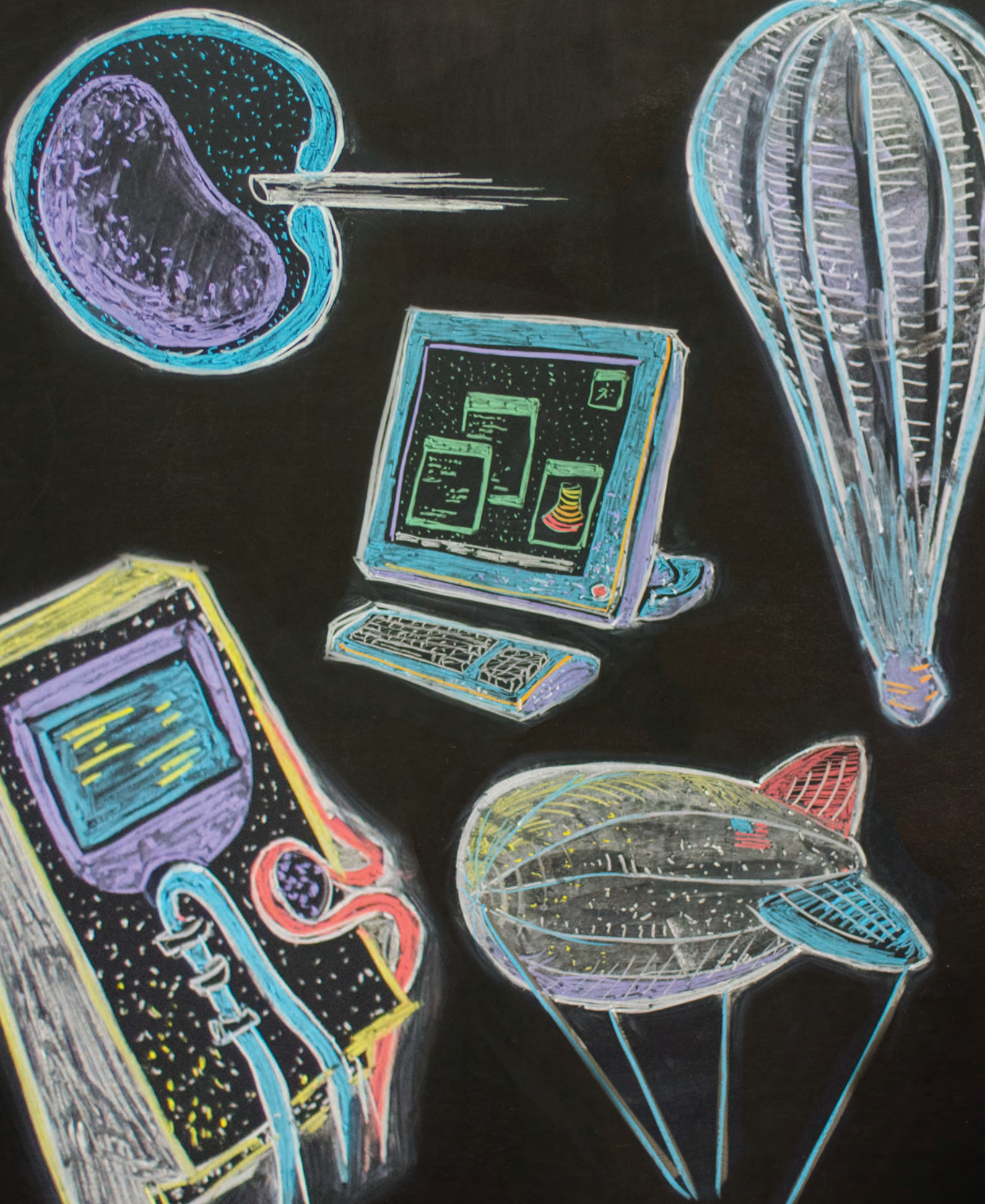
Built to Fly:

Students Build Cockpit, Flight Simulator to Prepare for Aeronautics Careers

New opportunities to study for aeronautics careers are evolving for students, who have built a commercial-grade flight simulator. The cockpit includes a vision system and modern displays simulating F-15 and F-22 fighters, business jets and general aviation piston planes, as well as the space shuttle and the X-15.

With the Department of Electrical Engineering & Computer Engineering sending several graduates into the industry annually, **Ben Dykstra** (EE15) initiated the project last year to help better prepare students. Dykstra is a private pilot who served in the US Air Force before enrolling at Mines.

“I anticipate our students who are targeting aerospace and avionics careers will be in high demand after gaining this practical experience,” said interim department head **Scott Rausch** (EE75), a private pilot who worked in the avionics industry for twenty-seven years.



Internships with IMPACT

Mines chemical engineering senior Taylor Sands faced the twelve-year-old twins and their mother last summer. The word blanketed the air. Cancer. Both girls had it, ovarian stage four. Still reeling from the diagnosis, these children had forty-eight hours before treatment began to decide if they ever wanted kids of their own.

The risk was enormous, but for \$25,000 they could receive estrogen shots to force ovulation, their eggs harvested and frozen for a monthly fee. Working with a gynecological oncologist, Sands guided them to a decision.

She was an intern at MD Anderson Cancer Center in Texas, one of 530 Mines students interning with over 230 employers in 2015 at well-known companies like Microsoft, Ford, ExxonMobil, and NASA, as well as local firms and start-ups like VRC Metal Systems.

“Internships are an integral part of the Mines experience, and our internship program is second to none,” says Heather Wilson, SD Mines president.

Seventy-eight percent of last year’s graduates had at least one paid internship before graduation. That’s 40 percent higher than the 2013 national average, according to *US News & World Report*. Mines students are working on projects with real impact. In Sands’ case, matters of life and death.

Asked to make a fertility decision aid for cancer patients, Sands developed software to scour online forums for means of helping patients decide among adoption, freezing, gestational carriers, and in-vitro fertilization.

Now back on campus, she’s writing a paper on her research to be

jointly published with the MD Anderson Cancer Center—which has extended both a standing offer of employment and medical school recommendation. She’s not alone. The National Association of Colleges and Employers reports employers make full-time offers to nearly 65 percent of their interns. At SD Mines, the majority of students get multiple relevant experiences and job offers before they walk across the stage with diploma in hand.

“Ninety percent of me wants to go to medical school, but I love chemical engineering, too,” Sands says. “Cargill offered me a spring co-op conducting seed plant-based research. While it may not be life or death like MD Anderson, you’re feeding people, helping them in their everyday life.”

That desire drives mechanical engineering and pre-med senior Rebecca Ceremuga, too.

At Medtronic, Ceremuga helped develop a cartridge for dialysis machines, the only alternative to an organ transplant for patients with kidney failure.

Unlike traditional machines where the fluid that removes blood waste products is discarded after a single use, this cartridge recalibrates and recycles fluid. Ceremuga says the greatest impact will be in China and India where purified water is scarce.

With plans to attend medical school, Ceremuga now works as a medical scribe for a gynecologist and shadows doctors in neurology and orthopedics.

Senior mechanical engineer Cory Mergen interned at Aerostar International, working on tethered aerostats—blimp-like aircraft





used for surveillance at bases overseas. The project was fitting for the former Army Ranger whose flight termination system, which lowers aerostats if the tether breaks, was adopted by Aerostar.

His second project had equally international reach. Google's Project Loon brings Wi-Fi to remote areas through traveling balloons. Google needed balloons to lift heavier payloads without increasing size, partnering with Aerostar to develop stronger, thinner film blends. Mergen was in charge of testing to find the most promising ones. Following graduation, he hopes to work in aerospace engineering.

Last summer marked senior geological engineering major Chance Costello's third internship with Fortune 500 oil and gas company QEP Resources. His first began his sophomore year, monitoring production and repairing maintenance systems in Wyoming. In 2014 he transferred to Oklahoma, determining where to drill to most effectively extract oil. His latest internship focused on hydraulic fracturing, designing wells for maximum production.

The balance of on-site experience and remote modeling proved an asset. "Seeing machines in operation and the problems operators face was valuable," Costello says, especially as oil prices fluctuated and the company placed increasing weight on his analyses.

Kimberly Clark's **Lars Nordang** (ChE94) is one of 150 employers who regularly recruit science and engineering leaders from Mines. "We're looking for high-quality engineers, and we know where to find them."



*Pictured are just a few of the hundreds of students who landed internships in 2015 ranging from the medical field to a mile underground. Top row from left to right: chemical engineering junior Danielle Taylor spent the fall checking air quality in corn unload sites at Cargill's Corn Milling North American locations; mechanical engineering sophomore Rohit Dulal interned as a Littelfuse quality assurance engineer reducing circuit board soldering defects; senior mechanical engineer Cory Mergen tested balloon film blends for Google's worldwide Wi-Fi initiative at Aerostar. Bottom row from left to right: Mechanical engineering and pre-med senior Rebecca Ceremuga works as a Black Hills Obstetrics and Gynecology medical scribe; senior mechanical engineer Matthew Hoffman descends 1,000 feet underground at Barrick Gold; December graduate **Justin Huntley** (CE15) inspects a high-level water tower as part of his internship at Banner Associates, where he now works full-time.*



Coach Stacy Collins and the Hardrockers raise the Homestake Trophy after the 2015 Black Hills Brawl victory.

A RIVALRY FOR THE AGES

On November 10, 1900, the School of Mines faced off for the first time against the Spearfish Normal School for a game of football in Rapid City. In a game later described in the *Engineer* as a “hard fought contest with dazzling plays,” the School of Mines would come out on top, 27-0.

And so began the rivalry that would become the longest in NCAA Division II athletics history and the third-longest in all of college football, with 130 meetings to date.

With the exception of a 0-0 tie in the first of two games played in November 1906, the Hardrockers would go on to win every matchup against Spearfish until the second-to-last game in 1916. They would come back in the 1917 season, however, to defeat Spearfish three times. In 1936, Mines would lose a lopsided 46-6 game, the first time the two teams played on M Day.

The Black Hills Brawl grew fiercer through the decades as the record evened up, with the Hardrockers holding the advantage of sixty-one wins, fifty-eight losses, and eleven ties. The biggest footnote in the history books occurred just this past season as the 130th rivalry game was played at home in a sold-out O’Harra Stadium and broadcast nationally on ESPN3.

“The atmosphere in the locker room for the Black Hills Brawl is very much different than other contests. Alumni, faculty, and the student body look forward to this game as much as we do, and it showed in the sold-out attendance this year,” says tight

end Cameron Luna, a senior civil engineering major, whose big plays were key in last season’s 28-26 Hardrocker victory. “During the Black Hills Brawl, Dunham Field becomes one of the most electrifying places in the entire state.”

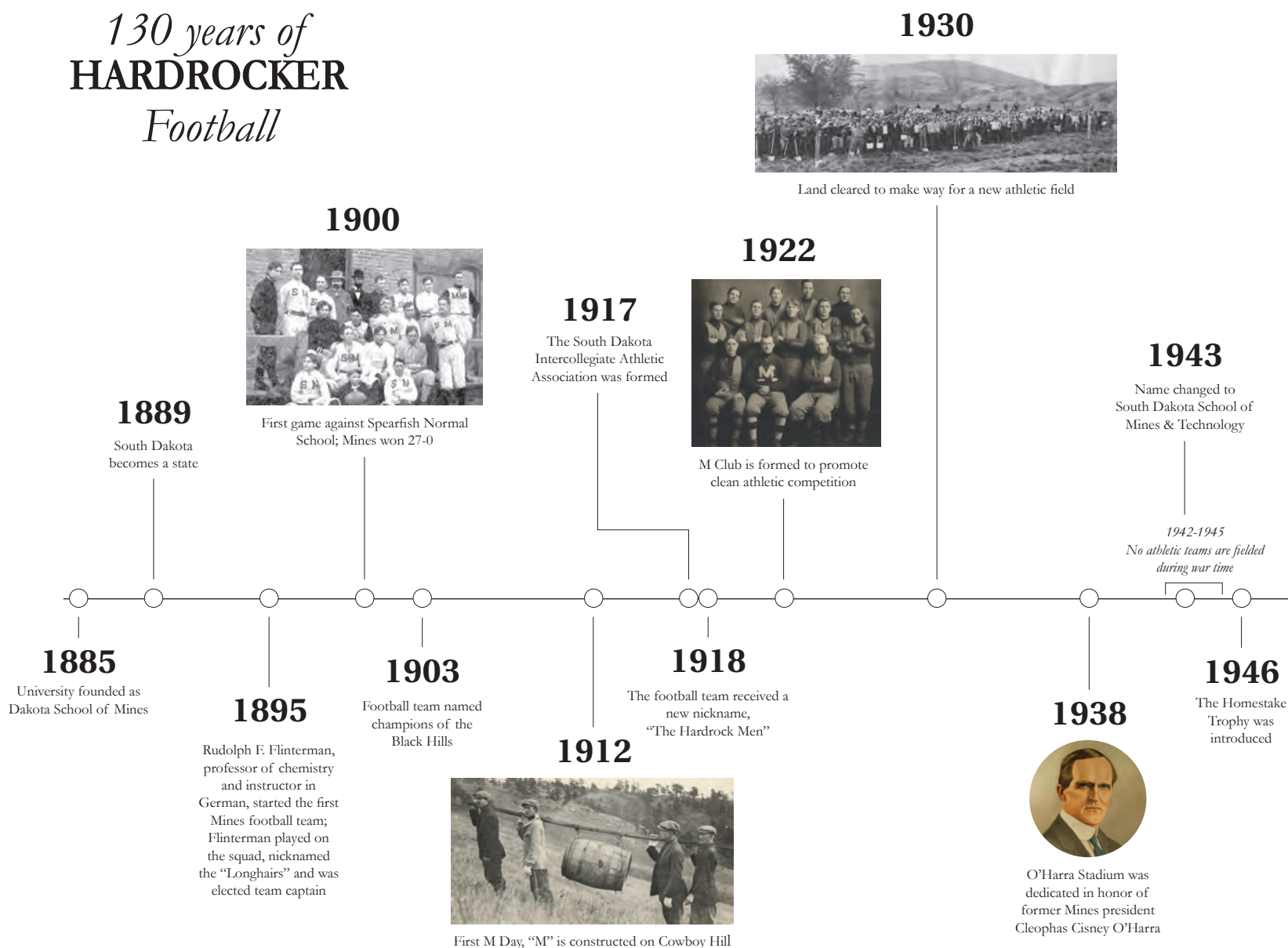
One of the factors in building an exciting rivalry is proximity. SD Mines and Black Hills State are separated by a mere fifty miles, which makes it easy for the fans of the visiting team to attend away games. While the host location has generally alternated between Rapid City and Spearfish every year, the Hardrockers will host the Black Hills Brawl again in 2016 as the rotation will change due to Mines’ transition into the Rocky Mountain Athletic Conference.

The evolution of the rivalry is storied.

During World War II, Mines did not field any athletics teams between 1942 and 1945. When competition resumed, something more than bragging rights would be awarded to the victor—the Homestake Trophy, named for the nearby Homestake Gold Mine in Lead, South Dakota.

Black Hills Teachers College (renamed in 1941) would be the first to hoist the traveling trophy after shutting out Mines 6-0 on October 4, 1946. The Hardrockers returned the shutout favor the following year, defeating Black Hills 7-0 and taking their first possession of the trophy.

130 years of HARDROCKER Football



1950s: Black Hills took the trophy in 1950 and kept it until the 1951 season when the Hardrockers went undefeated. In the final game of the season, Mines reclaimed the Homestake Trophy in a 20-7 victory and also captured the South Dakota Intercollegiate Conference Championship. The Hardrockers finished the season with one of the best defensive records in the nation that year, allowing only 35

points while scoring 168 in their eight-game schedule.

The Hardrockers maintained possession of the trophy until the 1956 season, when they didn't record a single win. The next two years saw the rivalry games end in ties, but Mines hoisted the trophy again in 1959 with a final score of 20-19.

1960s-1970s: The Homestake Trophy spent almost an equal

number of years at Black Hills and at Mines throughout the '60s and '70s.

Current Alumni Association President **Dave Berg** (ME73), who played for the Hardrockers from 1968-1971, recalls the intense atmosphere in the stands during the games, even though coaches tried their best to keep players from getting distracted.

"Back then it really was a

brawl. The crowd was always rowdy, and the student body presidents of both schools had a big bet on the line," says Berg, referring to a mid-field "panting" after the game.

1980s-2000s: Although the Hardrockers fielded conference championship teams in the early '80s, the trophy split time almost equally between Mines and the newly renamed Black Hills State University by the end of the decade.

1951

Hardrocker football goes undefeated claiming the Homestake Trophy and the South Dakota Intercollegiate Conference Championship

1971



Mines student body president **Gary Veurink** (ChE72) collects on the bet with BH student body president

1982



Named football team of the year by the South Dakota Sportswriters Association; fullback **Doug Beisner** (EE82) breaks the school's record for most touchdowns in a single game with 5 against Black Hills State College

1985

SD School of Mines celebrates 100 years

2014



Grubby gets a facelift

1959



First printed appearance of Grubby the Miner

1967



First Hardrocker cheerleading tryouts

2011



Students vote to tax themselves to raise funds to expand wellness center

2015



A record 5,000 fans fill O'Hara Stadium for nationally broadcast Black Hills Brawl

1953



Shiftless Sam first appears as school mascot, created by **Jack Ihli** (GeolE55)

1970



Mines' kicker **Maher Barakat** (ME71) drafted by the Denver Broncos

1980s
Hardrocker football captures five SDIC championships

1998

Ryan Cadwallader (CE96) takes record for most receiving yards in a season (1,182)

1989



Coach **Gary Boner** (1971-1989) becomes the winningest coach with a 92-73-7 record and seven conference championships

2004

Christensen Hall of Fame completed

2013



Mines accepted into NCAA Division II

The 1990s and 2000s would prove tough for the Hardrockers, as winning records were difficult to accomplish. BH State would win the Homestake Trophy sixteen of the twenty meetings.

A New Era: The duel with BHSU in 2010 proved one of the greatest games ever played between the two teams, with both nationally ranked and still in the hunt for a Dakota Athletic Conference

title. The Hardrockers won 23-20 in double overtime. SD Mines finished the year with a 7-3 overall record, second in the conference, giving the Hardrockers the first winning season in twenty-three years.

Over a century after the Hardrockers' first game against "the Teachers," both teams would find themselves preparing for their biggest matchup yet. The September 12, 2015, clash of the rivals

was broadcast nationwide on ESPN3 as the NCAA Division II Game of the Week. This game attracted the fourth-highest number of unique viewers of all ESPN3's Division II Game of the Week broadcasts for the season. The Hardrockers would win in a close battle that came down to the wire, extending their rivalry victories to sixty-one.

"It was a phenomenal atmosphere, and our players

fought through adversity and injury to come out with a big victory," says Hardrockers Coach Stacy Collins. The team hopes a second straight year with a 2016 home-field advantage will keep the trophy on campus.

The Homestake Trophy is currently on display in the Surbeck Center main level case, serving as a source of pride and inspiration for all Hardrocker fans.



RISING STARS

STEM From Space Grant Consortium

Jason Ash has been hooked on space exploration since peering up at Halley's comet at the age of ten. As a mechanical engineering associate professor, **Ash** (ME99), PhD, is living his NASA dream right here at South Dakota Mines through collaborations with the South Dakota Space Grant Consortium.

Early in his doctoral pursuit, Ash—who earned his bachelor's, master's, and doctoral degrees at Mines—was selected as an Air Force Research Laboratory Space Scholar and worked in the Space Vehicles Directorate at the Kirtland Air Force Base in Albuquerque, New Mexico. An award from the South Dakota Space Grant Consortium helped Ash complete his PhD research on the interfacial mechanics of composite materials, with applications in the aerospace industry.

Include him among the 60.5 percent of South Dakota Space Grant recipients in the past ten years who've come from Mines.

The state's Space Grant Consortium, one of fifty-two across the United States, opened on the Mines campus in 1991 as the logical fit at South Dakota's science, technology, engineering, and mathematics (STEM) institution.

Since 2005, the Space Grant board has awarded \$1.6 million in NASA fellowships and scholarships to 542 college students throughout the state, with 328 of them Mines students who have received \$922,730.

"We get a lot of real stars. Some of our really good students are shoo-ins for NASA careers," says SD Space Grant Consortium Director Ed Duke, PhD, also a Mines professor of geology and geological engineering.

Eighty-nine percent of students supported by the SD Space Grant from 2006-2013 are either working in a STEM career or pursuing advanced STEM degrees.

Among the number of Mines graduates who have been hired by NASA, none have been more high-profile than **Ryan Brown** (CE14), who graduated to a job waiting for him at Mission Control in the Johnson Space Center in Houston. Brown spent three internship tours with NASA developing moon landing simulation software for astronaut training.

Carly Sandin Kijewski (ME14), now in graduate school in Illinois, has had two NASA internships, as well as a stop at Boeing, where she worked on the Space Launch System, a new rocket that will send Americans into space. She will continue to intern in the Pathways Program at NASA's Goddard Space Flight Center as she completes her master's degree.

"It is satisfying when we get students who come in and do very well. We've had a number of impressive and inspiring student success stories," said Deputy Director **Tom Durkin** (MS Geol86).

In addition to awarding fellowships and internships throughout NASA centers and the aerospace industry, the Space Grant provides seed grants for innovative research and education projects, K-12 teachers, student opportunities in precollege robotics, and diversity programming.

In 2014, graduate **Ian Markon** (MetE14) was awarded \$68,000 to research whether certain inks, with their organic components, can survive in space. In 2012, graduate student **Anthony Kulesa** (CE12) and advisor Marc Robinson, PhD, were awarded \$66,000 to research composite materials for lunar structures. Mines students and faculty alike benefit from the SD Space Grant Consortium's presence on campus.

Over \$7.7 million in NASA research grants have been awarded throughout the state since 2007, and South Dakota is the top recipient state of NASA funding through its Experimental Program to Stimulate Competitive Research (EPSCoR).

Among recent NASA EPSCoR awards: Dimitris Anagnostou, PhD, \$750,000 to develop direct-write printable spacecraft materials and electronic and electromagnetic devices for future exploration, and Zhengtao Zhu, PhD, \$750,000 to develop new materials and technologies for artificial skin for astronaut suits and sensors for the outer surface of spacecraft.

Duke believes the university's STEM commitment and smaller size, as well as its connection with Space Grant, allows its researchers to be more in tune to NASA's high-priority areas.

"Because we have so many talented people here, the Space Grant benefits from its relationship with the School of Mines a lot more than vice versa," Duke says.



RC Skull climbs a vertical ladder during his Everest expedition.

TO THE TOP OF THE WORLD

Thousands of miles from Rapid City, the tallest peak in the world towers over Nepal and Tibet. With a peak elevation of 29,030 feet, Mount Everest has just 30 percent of the oxygen present at sea level. Avalanches, altitude sickness, and frostbite are guaranteed risks for anyone attempting to reach the summit. Above 26,000 feet, body movements continue solely from muscle memory as the lack of oxygen causes one's mind to become cloudy. When the summit is reached, little time is spent celebrating in wind chills nearing -70 degrees before descending to the base of the mountain, just as dangerous as the ascent.

Rapid City native **RC Scull** (CE11, MS ConstMgmt13) not only successfully climbed Everest and safely returned home, he also summited the tallest peaks on every other continent in the world, known as the Seven Summits (or Mighty Eight Summits including Mount Kosciuszko in Australia).

Scull's journey began in the sixth grade when he was asked to read an article about Everest aloud to his class.

"It set the tone for the rest of my life," said Scull, who began reading every book on Everest he could get his hands on.

At age twelve, Scull joined the Boy Scouts to learn the basics of hiking, camping, and first aid. As an Eagle Scout at sixteen years old, he completed a mountaineering course in the Rockies with Outward Bound. The following year, Scull completed another mountaineering course with Seattle's Alpine Ascents, the company with the highest success rate of guided climbs of the Seven Summits. A month later, at age seventeen, he would summit Mount Rainer in Washington.

After graduating from Rapid City Christian High School, Scull completed his freshman year of college at Montana State University before transferring to South Dakota Mines to study civil engineering.

From 2005-2008, Scull and his father, **Robert Scull** (CE82), conquered seven of the Mighty Eight Summits: Argentina's Mount Aconcagua (22,834 feet), Australia's Mount Kosciuszko (7,310 feet), Indonesia's Carstensz Pyramid (16,023 feet), Antarctica's Vinson Massif (16,067 feet), Russia's Mount Elbrus (18,510 feet), and Alaska's Mount McKinley (20,320 feet). Most of the climbs

spanned ten days to three weeks, with the exception of Mount Kosciuszko, which was only a day's hike.

In March 2008, Scull took the semester off from his civil engineering studies to begin the journey to Nepal.

After flying into the Khumbu Valley from Katmandu, Scull, his father, and an expedition team lead by local Sherpas, began the ten-day trek to Base Camp. A few days later, Scull's group met the Lama Geshe, a teacher of the Dalai Lama and a revered spiritual leader who prayed their team would have a safe expedition. Each climber was given a khata, a blessed string made of braided nylon to wear tied around the neck for the expedition.

Once reaching Base Camp (17,500 feet), which is 3,000 feet taller than any mountain in the continental US, Scull and his group would spend a few days resting and acclimatizing to the higher altitude. Although the elder Scull would not attempt to summit Everest, he did spend some time at Base Camp with his son.

In order to properly acclimate to the higher altitudes, climbers must ascend to gradually higher and higher camps and then return to lower camps to recover, which is referred to as, "climb high, sleep low." This acclimatization process can take four to six weeks, and teams must battle blocks of ice the size of cars, avoid sudden avalanches, and cross ladders together over bottomless crevasses while carrying forty-pound backpacks in high winds.

Making it to the 24,000-foot high Camp III meant he'd earned a spot on the summit team, but the night spent there offered little comfort.

"That night was a contender for the worst night of my life," Scull

says. “Our oxygen saturation levels were extremely low. Everyone had pulsating migraines so horrible the team was vomiting. If you were lucky you got two to three hours of sleep.”

Mid-May marked the last descent before the summit push. Then in the early hours of May 19, Scull’s team left Base Camp for its final ascent. They spent two days at Camp II before pushing on to Camp III and were rewarded with supplemental oxygen upon their arrival. The next day, they forged on to Camp IV (26,500 feet). Also known as the “Death Zone,” this altitude provides the worst of the physical and mental challenges to the climbers.

Scull recalls, “Your body can’t process any calories you take in and is struggling to survive. Your thought process is slow, your decision making is difficult, and your judgment clouded.”

But the sight of the summit 3,000 feet above provided all the motivation Scull needed to continue.

“My feeling at the moment was that it is achievable. To dream of a goal for so long and to be looking it right in the face is a very powerful experience.”

Scull’s team departed Camp IV around 9 p.m. on May 23. Climbing steep and unfamiliar inclines through the night in wind chills near -70 degrees, the group rarely stopped for a break. As the sun rose, the team reached a narrow and complex ridgeline, only six inches wide in some areas, which would lead them to the summit.

On May 24 around 7:30 a.m., Scull finally reached the summit of Mount Everest.

“The feeling was incredible; we really did it. We were standing on the top of the world!”

The team spent just ten minutes at the summit. The extreme wind chills meant most digital cameras were not working, but Scull had two disposable cameras for the occasion. After quick photos and a few handshakes and hugs, they made their final descent and returned to Katmandu, where they would get the chance to reflect on their accomplishment.

“Climbing Mount Everest was an adventure that has changed my life forever,” Scull says proudly.

Later that year, Scull would climb Mount Kilimanjaro (19,339 feet)

with family and friends. Finishing that climb at twenty-one years and nine months old made Scull the youngest male to summit the tallest mountains on every continent, a record he would hold for about a year.

With the Mighty Eight Summits behind him, Scull would soon complete his bachelor’s degree in civil engineering and would go on to earn a master’s in construction management from Mines, giving him the opportunity to accomplish another lifelong goal—follow in the footsteps of six generations before him and join the construction industry.

After a brief stint with Baker Hughes in North Dakota, Scull would return to Rapid City to join his father at RCS Construction,

a company that has completed several projects on campus ranging from library and dorm remodels to water infiltration and fire code upgrades.

Throughout his adventures, the people are what Scull treasures most, whether it was the climbs with his father and the “superstar Sherpas” of Nepal or fellow Mines alumnus **MR Hansen** (CE69), senior lecturer and professor emeritus in the Department of Civil & Environmental Engineering at Mines.



RC Scull on the top of Mount Everest

Hansen, PhD, enjoyed working with Scull at Mines both in class, and as part of the American Society of Civil Engineers and Concrete Canoe Team. “He always had a positive and can-do attitude, always helpful to others, great initiative, and he knew how to have fun, too,” Hansen says.

Those personal attributes, along with mental and physical toughness, have helped Scull accomplish his career and mountaineering goals.

Scull returned to Nepal in 2012 to climb Ama Dablam (22,349 feet) and also summited Mount Blanc (15,778 feet) in the Alps earlier in 2015. While no immediate plans are in place, he hopes to return to the Alps someday to conquer Matterhorn and Eiger to complete the “Royal Trilogy” (along with Mount Blanc).

“I feel like I’m in my element on the mountain. It’s not about material things, it’s about experiences.”

Distinguished Alums



Five alumni were honored at the 2015 Fall Commencement as Distinguished Alumni for their career and personal accomplishments since leaving the School of Mines. From right to left are **Daniel K. Carlson** (ChE77), **Jeffrey W. Hohle** (GeolE78), and **Barry M. Granger** (ChE81). Honorees **Karla M. Callahan** (Chem76) and **Michael D. Ellwein** (ChE61) were unable to attend the ceremony.

1940s

Armand Sedgely (CE49) wonders if there are any '49 WWII vets remaining.

Robert Winkler (CE43) had to give up golf and driving last month. He notes, "Things don't work right at age 93." Kathy, his wife, keeps him moving. He was sad to miss the 2015 reunion.

MEMORIALS

Arlyn W. Boekelheide (Ex44)

Ardeth J. Lee (CE43)

Jack V. McMaster (MetE43)

C. Dean Starr (MetE43)

Helen B. Wrede (Ex41)



Sue Bower (daughter), Peter Bower (son), Frank Aplan (MetE48), Lucy Aplan (daughter), Kyle Bower (grandson)



SD Mines alumna Susan Banks (GeolE75), Ronnie Ranich, Frank Aplan (MetE48), Richard Ranich (friend and former student of Frank Aplan)

Frank Aplan (MetE48) was recently inducted into the National Mining Hall of Fame during a banquet in Pittsburgh, Pennsylvania. Among the most influential mineral processing leaders in both industry and academia, Aplan's studies of the processes involved in the preparation of coal and ores are acknowledged worldwide for their broad applicability. An authority on flotation, Aplan is especially known for his studies of the wetting of solids and their control through the adsorption of surfactant films and for his work on the effects of atomic defects on the properties effects and behavior of solid-liquid interfaces. His entire Hall of Fame induction biography may be viewed at <http://mininghalloffame.org/inductee/aplan>.

1950s

Dick Berg (CE58) lost his wife of fifty-seven years in May to a heart attack. His niece, **Karen Palm** (MetE77) and her husband, **Owen Palm** (GeolE75), encouraged him to attend the Five-Year Mines Reunion. He notes that he has attended every reunion since 1965. He enjoyed the reunion, but missed having Carolyn along.

Donald Bisson (EE51) notes San Antonio, Texas, is a great place to live. It is now a World Heritage City.

Alva "A.L." Dougal (CE50) celebrated his ninety-first birthday on October 11, 2015. He celebrated with many family members and guests.

Warren Dowler (ChE56) is retired and having a great time!

John Mohr (EE56) and his wife, Alice, are still playing badminton and traveling. They had a wonderful fishing experience in Alaska and saw their daughter and her family at the same time.

Owen Tripp (ME50, MinE51) enjoyed the swell job on the *Hardrock*. He keeps in touch with **Don Watson** (ME50) and **Jack Hopper** (MetE50). He wishes to pass on a thank you to **Paul Rafter** (EE80) for the gracious gift to the school of music.

MEMORIALS

James R. Emch (GenE58)

Robert V. Helling (CE54)

Alan E. Liffengren (ME57)

Charles R. Peterson (EE56)

John D. Reishus (ME50)

David W. Stearns (MS Geol55)

Walter H. Schick (Chem59)

John R. Ulteig (GeolE55)

Vern L. Vigoren (GeolE57)

1960s

Loren Anderson (EE65) enjoyed seeing classmates and the campus at the May graduation and the Fifty-Year Reunion. He notes it was well organized and Dr. Wilson left an excellent impression on him.

Theodore Andrews (CE62) and his wife, Louise, are both 92 years young and enjoying slower living in their own home. He still bowls twice a week while Louise uses her embroidery and sewing machines.

Alfred Broz (MS Phys68) enjoyed his one year at SD Mines and his best mentor, James Dean Patterson.



Dean Oliva (GenE56), Brandon Carda, Marlene Oliva

Dean Oliva (GenE56) and wife, Marlene, with Brandon Carda at the SD Mines versus Azusa Pacific game; they share the common hometown of Huron, South Dakota. Dean played football, basketball, and ran track at Mines.



Front row (l to r): Pat Cain (CE67), Jane Watson-Baumgartner (ChE82), Jerome Baumgartner (Chem75), Steve Baumgartner (ME73), Wendlin Baumgartner celebrating his ninetieth birthday; back row (l to r): Kevin Baumgartner (IE92), Sarah Baumgartner (IE93), Dale Baumgartner (MetE92), Andrew Baumgartner (ChE84), Robert Baumgartner (CSc86), John Baumgartner (ChE82)

Patrick Cain (CE67) attended the 2015 All School Five-Year Reunion, as well as a Baumgartner family reunion with more than one hundred attendees, many of whom were SD Mines alumni. Sadly, Patrick passed away in August following the reunions.

Carl Coad (Math60) is still enjoying retirement and watching grandkids' sports, plays, and Irish dancing.

Jim Crouch (MinE68) relates he and his wife, Melisa, had a wonderful time at the reunion.

Joseph Hilt (CE62) and his wife, Bonnie, enjoy spending six months in Naples, FL, enjoying the sunshine and boating. He has changed the name of JH Hilt Engineering, Inc. to Hilt Construction, Inc. as the next generation comes aboard.

Leo Hughes (GeolE60) is still barely alive—not dead yet! He notes there is not very much green grass left around the SD Mines campus.

David Uherka (Math60) and his wife, Dorothy, are still Nordic skiing and doing volunteer trail work for the National Forest and Park Service.

Herbert Reichert (Math66) and Sally welcomed the newest addition to their family, their grandson Henry Herbert Tamm, on August 28, 2015. Henry joins their daughter and her husband along with older brother, Dylan.

Gary Vaplon (MetE69) is proud to say his daughter, Sara, earned her PhD in biological engineering and his son, Craig, is a structural engineer.

MEMORIALS

Patrick R. Cain (CE67)

Richard J. Chambers (ME66)

Paul G. Dries (ME69)

William R. Hinken (MetE63)

Ronald J. Kostelecky (MS Phys63; Former Faculty)

Marlyn C. Stubbe (Chem68)

1970s

Carmen Adams (ChE75) notes it was great to see everyone at the reunion!

Harold “Wayne” Grace (CE73) moved to the San Antonio, Texas, area this summer. The weather has been hot, but he is getting used to it.

Jeff Hohle (GeolE78) is enjoying retirement in the beautiful Black Hills!



(l to r) **Tim** (CE75) and **Jill Woster** (CE80), **Eva June Busse** (CE77), and **Kathy Rodgers** (CE76)

During a trip to Alaska last summer, Ed and **Kathy Rodgers** (CE76) along with their daughter, Renee, and **Eva June Busse** (CE77) had a wonderful visit with **Tim** (CE75) and **Jill Woster** (CE80) at the Woster's home in North Pole, Alaska. The long Alaska summer days resulted in an amazing garden and beautiful flowers in the Woster's yard. Visible in the picture is a six-foot electric fence necessary to keep the moose out of their garden. While in Alaska, the travelers visited Fairbanks, Denali National Park, Anchorage, Skagway, Juneau, and Ketchikan. They were fortunate to be part of the 30 percent of Alaska visitors to see Denali in full view without any clouds.

Mark Howe (Phys77, MS Phys79), a physicist with the University of North Carolina (UNC), currently is programming data for the MAJORANA experiment at Sanford Underground Research Facility in Lead, South Dakota. Prior to joining UNC, Howe was part of the SNO collaboration that won the 2015 Nobel Prize for Physics for the discovery of neutrino oscillations, which shows that neutrinos have mass. His collaboration was also awarded the Breakthrough Prize in Fundamental Physics.

Gregory Knell (GeolE76) is self-employed as an environmental consultant. He works on mining, oil and gas, and landfill projects as a contractor.



Linda Pearson and **Bonnie Berg** (seated), **Larry Pearson** (ME72) and **Dave Berg** (ME73, standing)

Dave Berg (ME73) and his wife, Bonnie, were glad to visit Linda and **Larry Pearson** (ME72) at their Montana home, where they enjoyed fishing and fellowship.

Tung-Lue Lin (MS CE72) writes he spent forty years in the field of structural engineering after receiving his master's degree in 1972. His first fifteen years were spent with private companies in metropolitan New York building high-rises, football stadiums, and nuclear power plants. He spent his last twenty-five years with the New York City School Construction Authority retiring in 2012. His wife retired from the IRS early this year, and they enjoy visiting friends and traveling.

Roger McCambridge (ME77) retired on April 30 as director of gas engineering for Wisconsin Public Service/Integritys after more than thirty years. He and his wife, Jan, are enjoying travel by motorcycle and car, and are checking off places on their bucket list.

Rajagopal Namperumal (CE71) enjoys being a student (piano music and Spanish) again!

Doug Schlepp (MetE74) has been named to the South Dakota Sports Hall of Fame. He finished at SD Mines as the all-time leading men's collegiate basketball scorer with 2,440 points. He led the 1973 Hardrockers to their first appearance at the NAIA national tournament. He still holds thirteen records at SD Mines, including points in a game (44) and free-throw percentage in a game (14 of 14), season (197) and career (617). He also holds the single-game assist record (18) and the season steal record (134).

Thomas Sheldon (ChE70) has a new granddaughter and is now enjoying retirement.

Dale Westendorf (ChE71) is still enjoying retirement in the Texas Hill Country.

MEMORIALS

Bill L. Steckelberg (ME70)

1980s

Jerry Afdahl (ChE87) and, wife, Loretta were surprised and pleased when their son decided to transfer to Mines in fall 2015. Tyler said he is really enjoying the school and loves the area.

Mike Harris (CSc83) enjoyed reading about the reunion in the last issue. His plans to attend the reunion were interrupted by a layoff, but he is happy to say he is joining the IBM Spectrum Scale Team as a senior engineer.

Dave Gosselin (PhD Geol87) published *Focus on Them: Leading the Mindset Revolution for Coaches, Educators, and Business Leaders*. It was recently recognized on the winner list of 2015 Idaho Author Awards and is available from Amazon and Aloha Publishing. davegosselinphd.com.



Drs. Howard, Yang (MS MetE82), and Lee (MS MetE83) in China

Stan Howard (MetE faculty), PhD, and former graduate student **Zhaoguang “George” Yang** (MS MetE82), PhD, and his wife **Hsiaowan “Wendy” Lee**, (MS MetE83) were at the Imperial Palace in Beijing in May 2015. Yang is a professor at Central South University in Changsha, China. Howard presented lectures and was Yang's guest from May 10-19, during which time they toured the Great Wall, Imperial Palace Gardens, Tiananmen Square, East Lake in Wuhan, and other wonderful sites.



Renita Mollman (CE88)

Renita Mollman (CE88) was named San Diego Chapter's 2015 Woman of the Year by the Women's Transportation Seminar, the region's largest transportation organization dedicated to advancing women in transportation. The award honors women who are outstanding role models in the field of transportation. Mollman is vice president and general manager of Burns & McDonnell's Southern California offices known for its innovative work in aviation.



Front Row: (l to r) Mary Margaret Sykora, Matthew Schallenkamp, Andrew Montoya, and Connor Janovy; Back row: (l to r) Monte Sykora (EE88), Ron Schallenkamp (Phys87), Tom Montoya (EE87), and Dan Janovy (CSc86)



From July 2000—Margaret, Andrew, Connor, Natalie, and Taylor

Amy and **Tom Montoya** (EE87) shared photos of future Hardrockers. Margaret is from Denver; Matthew was born in Texas and grew up in Brookings, South Dakota; and Andrew lived in Georgia and Tennessee before moving back to Rapid City; Connor is from Spearfish. Having all been born the same year in different parts of the country, their alumni parents used to joke about them being in the dorms together as freshmen at School of Mines—and it actually happened! Also pictured are Margaret, Andrew, and Connor as toddlers, along with Andrew's baby sister, Natalie, and Connor's baby brother, Taylor, taken in July 2000. Natalie and Taylor are both sophomores in high school this year, so we'll see if we get to repeat the on-campus photo in a couple more years!

David Helmers (CE85) was appointed vice president of Weyerhaeuser Distribution. He is a twenty-year veteran of Weyerhaeuser, most recently serving as director of sales and business development. He has held numerous other leadership positions within the company, including sales and operations process leader, mill manager, and corporate safety and environmental leadership.

Dietrich Whitesides (MS Geol89) is in environmental consulting. His oldest son is a Reserve Marine and a forestry student. His youngest son is still in high school and loves the marching band.

MEMORIALS

Vernon L. Rauscher (EE83)

1990s

MEMORIALS

James R. DeMaro (CE95)

Troy D. Oestreich (EE90)



Greg Hintgen (EE99) celebrating his fortieth birthday

Greg Hintgen (EE99) would like to personally thank **Chuck Cox** (ME00) for rolling his home as a kickoff to his fortieth birthday! Also, he had a wonderful time at the 2015 All School Reunion this past summer. If you missed it, put it on your calendar for July 8-12, 2020!

2000s

MEMORIALS

Seth R. Elkins (ME00)

Vivian T. Skaug (ChE02)



Sarah (Farber) Church (ChE04) announced that her daughter, Beverly (Bevi) Catherine Church, was born July 13, 2015. She is happy, smiley, and talkative. Sarah added that Bevi's birth was a rebirth of sorts for herself, too. She has found that a career as a midwife suits her better than engineering right now, so she said farewell to her job at Puget Sound Naval Shipyard in November 2015.



Nick Newell (CEng04) is excited to run through the SD Mines cheer tunnel after receiving his Outstanding Recent Graduate Award in Computer Engineering.

2010s

MEMORIALS

Benjamin W. Enterman (Ex15)

Jared R. Weischedel (Ex13)



Enjoying the Zero Year Reunion with his Senior Hat is **Caleb Dillinger** (MetE15), and his friends **Aaron Worlie** (ChE16), and **Brent Stoltz** (ChE15)



Teresa Worner (CSc13) married **Jeremy Warner** (CSc13) on June 20, 2015, in Fargo, ND. SD Mines friends at their sides included **Kevin Warner** (CSc13), **David Jarman** (CSc13), **Louisa Burden** (ACM13), **Mike Malkowski** (CSc13), **Alison Barnes** (ChE13), and **Chad Weeks** (MinE13).



Tony and Kelsey Kulesa's wedding

Tony Kulesa (CE12) and Kelsey had a SD Mines reunion at their wedding on September 5, 2015, in Aberdeen, SD. Included in the photo above are: (l to r) **Brent Morford** (CE10), **Terri (Morris) Morford** (CE09), Evalyn Morford, **Ben Sampica** (CE09), **Kirk Ehlke** (CE14), **Brian Ruppelt** (CE13), Kathleen Ryan, **Kevin Barry** (CE15), Brylee Streeter, **Jesse Parker** (CE14), **Nicholas Claggett** (CE15), **Tony Kulesa** (CE12), Kelsey Kulesa, Nolan Johnson (CE student), Kyle Carey (CE student), **Abby Fleck** (CE14), **Stephen Kilber** (CE12), **Michael Dollarhide** (CE14), **Max Reetz** (ChE15), **Erik Vik** (CE14), Chelsey Herber (CE student), **Ben Wolf** (CE14), Drew Vance (CE student), **Chris Timm** (CE13), Katie Reed (CE student), **Logan Vogt** (CE15), Brigit Kelly (CE student), **Spencer Ferguson** (CE14), Kristen Henderson, Ellie Henderson, **Cody Schellinger** (CE15), **Brooks Henderson** (MetE03), **Cassie Kulesa** (IE15), and Chris Bartelt. Not pictured **Jon Fairchild** (CE10), **Katie Schaefers** (IE13), and **Karen Schaefers** (CE11).



McGowan wedding: Cat Malin (ME14), Claire Lenschen (MetE14), Myriah Santistevan (MetE15), Kanysa Bartsch (ME14), David Frager (CSc89), Luke Wilson (ME14), Nancy (Bradwisch) Frager (Math88), Jonah Thune (ME student), Andrea Babbs (IE15), Megan (Frager) McGowan (ME14), Colin McGowan (ME14), Anna Haneline (Geol student), Jason Ash (ME99), Thomas Morgan (ME14), Andrew Kizzier (CSc15), Russel Hughes (MinE student), Alec Kratoska (ME14)

Megan (Frager) McGowan (ME14) and **Colin McGowan** (ME14) were married in Peoria, Illinois, last summer. They had a great time with all of their SD Mines friends who joined them. Both graduates work for Dow Chemical and have recently transferred to Minneapolis, Minnesota.

2015 Fall Grads



President Heather Wilson with
Dusty Swanson (ME15)



Senior speaker Zachary Kroehler
(ME15)



From left, Justine Noel Blade (IE15)
and Laura Marie Case (IE15)

Faculty & Staff



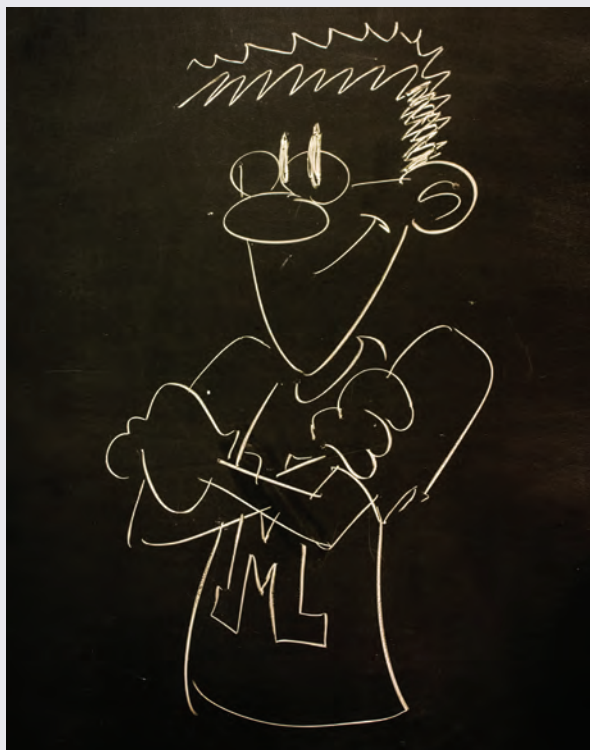
Dr. James V. Hamel

James V. Hamel, PhD, PE, PG, of Hamel Geotechnical Consultants, Monroeville, Pennsylvania, faculty member in civil engineering from 1969-1972, was inducted as an Honorary Member of the Association of Environmental and Engineering Geologists at the Association's Annual Meeting in Pittsburgh, Pennsylvania, in September 2015. He was cited for his contributions to both research and practice in geotechnical engineering and engineering geology with particular reference to his work with landslides, slope stability, and dams.

MEMORIALS

Dr. Zbigniew J. Hladysz
(Professor Emeritus)

Dr. Sailes K. Sangupta
(Former Faculty)



Chalk images on the front, back, and inside pages of *The Hardrock*TM were hand-drawn by Travis Kowalski, a professor in the Department of Mathematics and Computer Science. Kowalski earned both his bachelor's and doctoral degrees from the University of California, where he briefly studied studio art before falling in love with the art of mathematics.

SHARE YOUR NEWS

We are collecting items for the summer 2016 edition of *The Hardrock*TM.

Submit your Class Notes and Area Photos to alumni@sdsmt.edu.

Please identify individuals in photographs.



1: Midland, MI Spring Social: (from left, by families) **Cody Marnach** (ChE14); **Patrick Slowey** (ChE87); **Dan** (CSc00), **Erin** (ChE01), Norah, and Julia Lacher; Richard, **Tami** (ChE98), Henry, Chloe, and Luke Adam Heilman; **MacKenzie** (ChE11) and **Wyatt Stangohr** (ME11); **Megan** (ME14) and **Colin McGowan** (ME14); **Travis** (ChE12), Emily and Mason Hoon; Kelly Mathison, **Dan** (ChE96) & Ethan Wynia; Jon, **Anne** (ChE05), Alivia and Lars Putnam; **Kirby** (ChE99), **Amy** (ChE99), Elliott, Anna, and Ryan Kozel



2: Sigma Tau / Tau Beta Pi reception during the 2015 Reunion: (seated) **Tricia E. Gomulinski**, (EE/CSc98), Darlene and **Roger Kehm** (EE50), **Larry Simonson** (EE69), **Dick Logue** (CE66), **John Logue** (EE65), **Bill Brungardt** (EE70), **Dave Hammond** (GeolE69), **Rick Lyke** (EE66); (standing) **Jerald Byg** (CE72), **John Synhorst** (EE68), Del Mank and **Karla Callahan** (Chem76), **Gary Callahan** (ME70) and Jeanne Callahan, **Jim Deters** (EE68), **Charles Parks** (EE57), **Cassandra Degen** (MetE07), **Wayne Greaves** (GeolE71), **Harland Fawcett** (CE57), **Bradley Fawcett** (EE80), **Dick Schlumpberger** (CE65); (Not pictured, in attendance) **Jim Daley** (MinE94), **Don Range** (EE51), **Gary Stearns** (EE80)



3: Mines Muster (before BH game) – Dresden, Germany: (l to r) **Stuart Buchholz** (GeolE98), **Frank Hansen** (CE73), **Jerilyn** (ChE99) and **Lance Roberts** (CE98)

4: Mines Muster (BH game) – Mukilteo, Washington: (back row, l to r) **Mike Cole** (MinE77), **Leighton Lien** (EE83), **Dennis Schnable** (Phys72), **Jim Laurenti** (ME84) and **Lars Ditlev** (MetE74); (front row, l to r) **Tom Corcoran** (CE83), **Caroline Zebroski** (ME85), **Sue Laurenti** (MetE85), **Mike Rieger** (ME89), **Terri Perrine** (EE83), **Ram Dutt** (ME91)



5: Mines Muster (BH game) – Yankton, South Dakota: Alumni at Czechers Sports Bar and Grill (l to r) Mary Ann and **Wayne Anderson** (CE66), **Jody** (CE94) and **Darren Titze** (ME92) with son Cole, **Ashli Maddox** (Geol07), **Margaret (Schriever) Larsen** (MetE77), Shelley Heil, **Wayne Larsen** (GeolE76), Laura and **Carson Schott** (ME96), **Mike Heil** (MetE77), **Sarah** (IE98) and **Steve Sager** (IE96); (not pictured) **Dave Carda** (ME91), wife Sarah and daughter Anna



6: M Day Muster – Harriman, Tennessee: **Bruce Zerr** (ChE76) and **Lin Seder** (ChE69), with ‘photographer’ **Barb Seder** (Math70)



7: M Day Muster – Mitchell, South Dakota: (standing) **Bob Pullman** (ME69), **Keith Beck** (EE90); (seated l to r) **Larry Baruth** (ME66), Jan Baruth, **Bill Mulder** (ME74), **David Wagner** (ChE69); Lisa Beck (photographer)

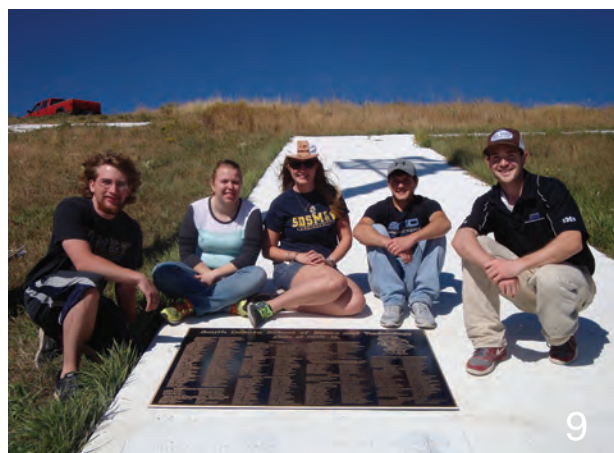




8: M Day Muster – Rapid City, South Dakota: The B-67 Crew on the ramp at halftime

M Day Muster footnotes: Denver, Colorado M Day Muster was cancelled; and Houston, Texas M Day Muster did not have a photo available.

9: M Week plaque install crew: (l to r) **Nick Claggett** (CE15), **Chelsey Herber** (CE16), **Shaun Preszler** (CE16), **Kathleen Ryan** (CE16), **Cody Lorenz** (CE15)



10: M Week picnic goes in Surbeck Center: (l to r) **Paul Gnirk** (MinE59), **Laura Case** (IE15), **Larry Simonson** (EE69), **George Garlick** (EE58)

11: M Week whitewash crew on a cold October day



12: M Week Alumni Dinner Immediate Past President **Mike Alley** (GeolE73)

13: M Week Alumni Dinner new Alumni President **Dave Berg** (ME73)



14: M Week Alumni Dinner
Outstanding Recent Graduates:
(standing, l to r) **Mark Sauder**
(IE04), **John Preheim** (EE04),
Nicholas Rogness (CSc04),
Mark Hanhardt (Phys07), **Grant**
Crawford (MetE04), **David**
Carlson (ChE04); (kneeling, l
to r) **Andrew Patceg** (CE05),
Nicholas Newell (CEng04),
Matthew Colvin (Math05);
(not pictured) **Crystal Hocking**
(Geol05), **Shawn Honomichl**
(IS09), **John Keefner** (GeolE04),
Jacob Koester (ME04), and
David Westhoff (MinE04)



15: M Week Alumni Dinner
sixty-year span of Miners: **Duff**
Erickson (MinE55) and **Tyler**
Artz (MinE15)

16: Golden, Colorado, Tailgate
Hardrockers watch our team play
Colorado Mines



17: River Falls, Wisconsin Tailgate
Hardrockers: (seated l to r) **Scott**
Fritz (IE04), **Tony Rea** (ME93),
Mary Himmeler (Chem88),
Robbie Gerarden's parents;
(standing middle row) **Carmen**
Adams (ChE75), **Alison Baue**
(IE12), **Bill Larson** (Math68),
Todd Person (EE90), **Greg**
Theis (ChE91), **Ray Chaussee**
(ChE63), **Dave Wagner** (ChE69),
Larry Simonson (EE69), Nate
Brown (Hardrock Club); (standing
back row) **Lowery Smith**
(GeolE51), **Keith Mutchler**
(ME71), **Bob Deis** (EE72), **Brad**
Johnson (EE92), **Louie Naber**
(ME84), **Bart Eddy** (ChE81),
Dick Morrison (MetE56),
Jayson Kkjenstad's parents





18: Ellensburg, Washington, Tailgate Hardrockers: (l to r) **Rory Retzlaff** (GeolE85), Trent McKinney (QB), **Marv Olson** (ME69), Coach Stacy Collins, **Bill Brodsky** (ME68)



19: Glendora, California Tailgate Hardrockers: (l to r) **Dean Oliva** (GenE56), **Jose Iguaz** (ME97), **Brett Mondt** (IS97) with son Andrew, Erv Mondt (former SD Mines head coach), and **Steve Wider** (GeolE71)



20: Mount Vernon, Washington luncheon: (seated l to r) **Robert Wilder-Jones** (Phys59), Pat and **Vernon Abild** (EE50), **Marlene Nelson** (ME74); (standing l to r) **Dawn Greenwood** (CE01), **Alan Hanson** (CE68), **Larry Merkle** (CE63), **Bob Pederson** (ME60), **Larry Simonson** (EE69)



21: Aberdeen, South Dakota, get-together: (l to r) **Rachel** (EE08) and **Blake Woodward** (ME09), **Larry Mettler** (EE89) and Renee Mettler, Heather Wilson (SD Mines President), **Terry Helms** (CE71) and Deanna Helms, **Karen Schaefer** (CE11)



22: Rapid City, South Dakota, Career Fair Mixer Group at Thirsty's

AREA MEETINGS

23: Dec. 3, Green Bay, Wisconsin gathering. Pictured left to right: **Brad Johnson** (EE92), **Dale Morrison** (ME04), Sherry Mutchler, **Keith Mutchler** (ME71), Carol Heinrich, **Edwin Heinrich** (CE66), Pam Belden, **Kerry Belden** (ME73), Janice McCambridge, **Roger McCambridge** (ME77).



24: Back Row (l to r) **Juan Villa** (GeolE89), **Bob Glodowski** (MetE67), Debbie & **Dean Psiropoulos** (EE84), **Russ Buyse** (EE63), **Denny Cullen** (ChE62), **Larry Schmaltz** (CE79), **Warren Germer** (EE65), **Ron Jeitz** (CE69), Middle Row (L-R) **Janeen Schuh**, Carolyn Buyse, Anna Cullen, Rita (Warren's fiancée), Robyn Pekas, front row (L-R) **Edouard Kouadio** (GeoE89), **Jim Schuh** (CEng04), **Brad Pekas** (GeolE85), Joel Kincart (Foundation President)



25: The Zero Year Reunion welcoming new graduates to the SD Mines Alumni Association L to R: **Denise Barton-Miller** (Chem76), **Andrew Jennings** (EE15), **Josh Dodd** (EE15), and **Scott Rausch** (EE75)



Internships

by the numbers

4

During her college career, **Taylor Schoenfelder** (ME15) completed 4 internships with different employers, which is higher than average.



\$17.57

The average hourly wage for a SD Mines intern.

78%

Of SD Mines students have at least 1 paid internship before graduation.

2,114
MILES

Furthest distance traveled by a SD Mines intern, from campus to Boynton Beach, Florida.

20

Cargill hosted the highest number of Mines interns with 20 students.

49

Graduates accepted a job offer from their internship or co-op employer.

530 Mines students interned with 225 employers in 36 states during the 2014-2015 school year.

7

The highest number of internship offers to a Mines student, in this case metallurgical engineering senior Anna Haydock.

SOUTH DAKOTA



SCHOOL OF MINES
& TECHNOLOGY

501 E. Saint Joseph St.
Rapid City, SD 57701

