

THE HARDROCK™

SUMMER 2015



SOUTH DAKOTA

M

SCHOOL OF MINES
& TECHNOLOGY



THE HARDROCK™

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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/

STAFF

Executive Editors

Jon Michaels
Tim Vottero (Chem84)

Managing Editor

Fran LeFort

Photography

Fran LeFort
Dani Mason
Jon Michaels
Madison Zimmerman-Dusek
Johnny Sundby Photography
Key Images

Writers

Jade Herman (IS09)
Fran LeFort
Danielle Mason

Graphic Design & Layout

Madison Zimmerman-Dusek

Art

Marcus Berger

THE HARDROCK™



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Steve Gassen (IE97)

Matt Goeden (CEng03)

Lacy Pomarleau (CE06)

Staff

Alumni Director

Tim Vottero

Administrative Assistant

Katie Harwood

Alumni Association

Surbeck Center

501 E. Saint Joseph St.

Rapid City, SD 57701-3995

Office: 605.394.2347

Fax: 605.394.2383

alumni@sdsmt.edu

http://alumni.sdsmt.edu



Dear Alumni and Friends,

By the time you read this, Reunion 2015 will be recent memory. The origins of our All-School Reunion date back nearly seventy years! As with those many reunions, this time-honored tradition is successful due to countless volunteers and alumni. Special thanks go to our reunion co-chairs **Dave Berg** (ME73) and **Kirby Mellegard** (EE72); the various activities committee chairs; our collaborative partners at the Foundation, the Hardrock Club, and on campus; and all those involved with our Alumni Association.

It has been my pleasure to serve as your alumni president since we celebrated the eightieth

anniversary of our Alumni Association last fall (October 5, 1934-October 5, 2014). I also have enjoyed meeting many of you at various events and gatherings around the country. I was able to make many shared alumni connections and reflect on many memories of fellow alumni or that favorite (or infamous) faculty member and our South Dakota roots. Thank you for welcoming all the traveling representatives of our great alma mater.

This past year we also joined the Foundation, the Hardrock Club, and the college in a 'collaborative' one-voice initiative called the "Mines Annual Fund" for all alumni and friends of SD Mines. This annual campaign replaced the Alumni Association's annual request for support and provides crucial operating revenue to continue our important mission. A gift to the "Mines Annual Fund" is another expression of support to our alma mater that has become the hallmark of dedicated alumni for more than eighty years. Sincere thanks go to everyone who contributed last year to this important lifeblood to our Alumni Association and our shared SD Mines mission. We look forward to your annual support going forward.

Please extend a warm welcome to our incoming Alumni President **Dave Berg** (ME73) for this next year, beginning in September and following our M Day (October 3, 2015) transition. Dave has proved his mettle in so many ways, including the 2015 Reunion, the Foundation Board, and the Hardrock Club. He certainly will continue our time-honored traditions with Hardrock spirit and seasoned leadership. Best wishes and thanks to all who continue to support our Alumni Association and our alma mater!

Mike Alley (GeolE73)

2015 President

SD Mines Alumni Association

At the turn of the twentieth century, National Smelting Company built a smelter just above what is today the third tier of O'Hara Stadium. Current metallurgical engineering students search Smelter Hill for remains from the Gold Rush in a mineral processing and resource recovery course. For the full story, see page 20.



125 years ago 1889/1890

Twenty-five-year-old George F. Duck becomes the second dean of the School of Mines. He is the youngest person to lead the institution.

Dakota School of Mines becomes South Dakota School of Mines when statehood is granted to South Dakota.

75 years ago 1939/1940

A memorial funeral service is held for former School of Mines President Valentine McGillicuddy, age ninety, who died in California. McGillicuddy's ashes are placed in a crypt at the top of Harney Peak.

A student pilot training program sponsored by the Civil Aeronautics Authority is approved as an elective for juniors and seniors.

50 years ago 1964/1965

More than 2,000 people attend the M Day picnic at Municipal Park and the longest parade in School of Mines history, with twelve high school bands, floats, and members of the faculty, staff, and student body.

The first student-oriented course in digital computer programming is offered.

Delta Sigma Phi dedicates its new fraternity house on East Omaha Street.

The Chad Mitchell Trio performs as part of the Mines Concert Series.

25 years ago 1989/1990

The new Classroom Building welcomes its first classes.

Dinosaurs invade campus: The Dinamation exhibit in the old gym delights (and terrifies) hundreds of visitors.

VCRs are made available to dorm dwellers, rented for \$3 per day.

Malcolm Forbes is speaker at winter commencement.

Hardrocker football Coach Gary Boner announces his retirement.





Dear Hardrocker Friends,

The unusually rainy summer weather in the Black Hills broke just in time for a wonderful gathering of alumni and their families on campus for the all-class reunion.

There were several highlights for me, and a handful of pictures in this edition capture the laughter and fellowship. I met **Lloyd Darnell** (CE44) who has been at every five-year reunion since they started in 1946. And **Rich Bue** (EE71) brought his grandson who couldn't have been cuter wearing his grandfather's green beanie.

On Friday during the reunion, alumni joined the family of former Mines President Harvey Fraser to dedicate the Fraser Gym. Over \$1 million was raised for the gym and another \$1 million for Harvey Fraser Scholarships. The new two-court Harvey Fraser Gym is a part of the 24,750-square-foot Stephen D. Newlin Family Student

Wellness & Recreation Center. Generous gifts from Mines alumni **Bill Brodsky** (ME68), **Larry Pearson** (ME72), **Doug Beck** (EE80) and their spouses, Judy Brodsky, Linda Pearson, and Leah Beck were joined by more than 400 additional contributors to complete the Fraser gymnasium.

With perfect timing, the rest of the Wellness Center was completed just before the reunion started so that alumni could get a sneak peek of the whole, beautiful facility that will be formally dedicated when **Stephen Newlin** (CE75) and the students can be with us in the fall.

In September, we will break ground on the \$6 million renovation of the old Chemistry building, allowing for the continued growth of our popular new Applied Biological Sciences program. The Foundation will start construction on our next new dorm at the same time.

We graduated over 400 students in the last academic year. Research awards are up. The Regents approved four new minors, and we expect twenty-one PhD students in Physics to be enrolled in the fall as a result of our alignment with the experiments under way at the Sanford Underground Research Facility in Lead, South Dakota.

So, there are a lot of good things happening, in part because of great support from loyal alumni and Mines supporters.

It's a great time to be a Hardrocker!

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



Photo courtesy of Nike

Alum Takes Nike Hi-Def

Travis Ernst (ME00) has been working at Nike world headquarters in Beaverton, Oregon, for over ten years. As a design engineer in the In House Manufacturing division, he has been involved with commercializing numerous airsoles for the Nike Air franchise. Most recently he was involved in the development of a proprietary digital sock printing process.

The Nike Elite Digital Ink printing process gives Nike designers the power to emblazon the Nike Elite sock with high-definition graphics and a myriad of vivid colors free of image distortion or fading. The process also maintains the performance benefits of the Nike Elite Sock—sweat-wicking, support, and impact protection. Currently the Nike Elite 1.0 digitally printed socks are available throughout the United States and can be customized online at Nike.com.

The Oregon Ducks football team, which has a long-standing close relationship with Nike, started the 2015 season by wearing a special edition printed sock for their spring ball game. Look for the technology in future sporting events at all levels of play.



Mines Education Yields Choices

Nine job offers. That's what three internships, two co-ops, a research project in Mongolia, and a South Dakota Mines degree helped Rapid City native **Brogan Pappel** (ME14) earn by the time he graduated in December of 2014.

Pappel, a mechanical engineering major, received offers from companies from Virginia to Idaho, but he ultimately joined Caterpillar's Leadership & Technical Development Program in Seguin, Texas, because he liked how the company challenged him to find his best qualities.

2015's Best New App



Johanna Wolf (CSc05) is the Mines alumna behind *Cheezburger*, the humor site that catapulted LOLcats and the FAIL blog to fame. As lead iOS developer she built *Cheezburger*'s delivery system

from scratch, transforming a site with seventy-five million page views a month into an app available in pockets nationwide.

Recently the Apple Store selected Wolf's app for a front-page feature, landing her *Cheezburger*'s "2015 Best New App" award. Free apps need 70,000 daily downloads just to crack spot #10. Wolf's *Cheezburger* caught Apple's eye among the store's million other apps its first year.

In a Pinterest-like layout, app users can scroll through posts from their favorite channels and upvote submissions, but rather than DIY projects, *Cheezburger* delivers humor. Users can also customize feeds, remix, and share submissions.

It's not Wolf's first success. She was de facto lead on the app *Crackle*, which made Apple's "Top Five Entertainment Apps of 2011."

Next up: *Cheezburger* Español.

On a Roll

for Post-Graduate Scholarships

Since her arrival in June 2013, South Dakota Mines President Heather Wilson has made it a priority to encourage students to apply for post-graduate scholarships. The push has already produced impressive results. Recent recipients of prestigious scholarships:

Travis Davis

2013 George J. Mitchell Scholar

Vaughn Vargas

2014 Udall Scholar and a 2015 Udall Scholar alternate

Jesse Hinricher

2015 Barry Goldwater Scholar

Taylor Rust

2015 Udall Scholar



A Career Retrospective

The Bangs may have retired but their legacy has only begun

The impact recent retirees Sookie and Sangchul Bang, PhDs, will leave on Mines is immeasurable. The duo have earned worldwide recognition for their individual and collaborative research that has improved the quality of industrial designs and everyday life.

About fifteen years ago Sookie, a microbiologist, launched the concept of self-healing cement. From the Empire State Building to Mount Rushmore, her cement restored landmarks damaged by cracks and was considered a material so monumental Reuters enshrined it in “Baby Boomer Inventions that Changed the World.”

Sookie and Sangchul, a civil engineer, retired in June after thirty years. It was only ten years ago that they turned their marital partnership into a working one when they refocused the cement’s application on airborne dust control in Mongolia’s ferocious sand storms.

Each will continue their work as professor emeritus. Sookie is tackling research as a collaborative member of Mines’ \$4.8 million Air Force contract team. The effort aims to develop efficient energy technologies for use in austere settings. Sangchul has landed a new contract developing offshore windmill designs. Both are continuing work on their National Science Foundation project to reduce the spread of global desertification through bacterial cement applications in Kuwait.

While their research has been an integral part of their interwoven personal and professional lives, their reason for staying at Mines for three decades run deeper. “The students here, they’re the best ones we could have imagined,” Sookie says.

$M^{A(TH)} \pm GETS$ $\sqrt{RADICAL}$

Mathematics may come from the Greek word “to learn,” but to Mines professors Roger Johnson and Travis Kowalski, PhDs, the subject is anything but ancient. The duo are shining a new light on math, attracting media attention to a fundamental but sometimes overwhelming subject even for engineering majors.

Moonlighting as a Super Bowl statistician, Johnson shows fans why they should trade their lucky socks for a loaded spreadsheet in a column he wrote for *The Huffington Post*.

During the NFL season he calculates weekly team ratings and designs models boasting a 67 percent success rate for the regular season and playoffs. His Super Bowl track record is 75 percent accurate.

From his not-so-coincidentally numbered office, McLaury 314, Kowalski rose to the math spotlight in March with Super Pi Day, a worldwide celebration of 3/14/15, the first five digits of pi, which is the ratio of a circle’s circumference to diameter.

His exuberant love of math landed a feature story on the front page of the *Rapid City Journal* and on TV newscasts.

More than media stars, they are among leaders within the math department who aim to bolster student success in Mines’ rigorous math curriculum with a new summer support initiative for incoming students.

Intel Intern Extraordinaire

Metallurgical engineer by day, basketball star by night, junior Mark Mazzucco is taking the tech world by storm. Intel named him Intern of the Week and ranked him first among interns for community service. Both honors earned him the 2015 Academic Internship Student Achievement Award by the Cooperative Education & Internship Association, a first at Mines.

Mazzucco has earned a 4.0 GPA and a psychology degree from Arizona State University. When he’s not leading Micron’s student design team, he mentors special needs youth and tutors at an elementary school.

Next up: A co-op experience with Exxon through December 2015 and eventually a master’s degree in materials science and engineering.



Graves Inspires

Greg Graves (ME80) returned as spring commencement speaker, encouraging new grads to make their efforts matter. After his own graduation, Graves joined Burns & McDonnell and climbed through the ranks to become chairman and CEO. The company is now one of the fastest growing and most successful engineering, architecture, construction, and environmental consulting firms in North America.

Love your Melon

Superheroes on the court and off, the Lady Hardrocker Basketball team last spring launched Love Your Melon, a campaign to improve the quality of life for children with cancer. For each special hat the team sells, one is given to a local child battling cancer.

Hardrockers dressed as super heroes and delivered hats to children in the hospital. Research shows that therapeutic experiences increase the success ratio of medical treatments. "We really want to make the children feel excited and comfortable," says McKenzie Becker, a sophomore guard from Andover, Minnesota.

Student Start-ups Hit the Market



Lounging in a light-filled room, Mountain Dew in hand and sporting T-shirts emblazoned with C#, a nod to the programming language, these students look like Silicon Valley transplants. This isn't just a classroom of coders. This is where businesses begin.

Modeling a typical start-up business plan, students in **Brian Butterfield's** (CEng98) mobile app class take an app from idea to market in four months. Butterfield, computer science instructor and entrepreneur, likens the pace to a

semester-long internship, at the end of which students launch an app in Google Play. This summer half of the students will head to industry internships, Google included.

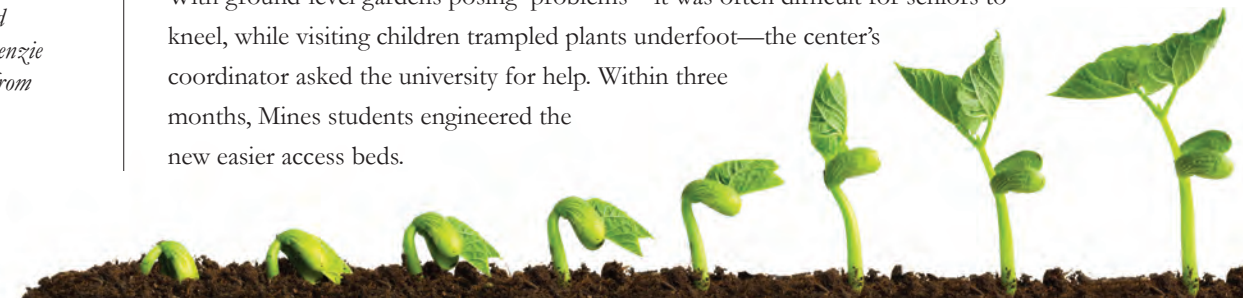
Others will form start-ups, groomed through a new departmental entrepreneurship course led by mathematics Professor **Antonette Logar** (CSc85), PhD. Logar's student CEOs pitch apps to vie for the Butterfield Cup, a competition founded by Brian, for a prized seat at business boot camp. Last year's winners are now in talks with investors to push their product to market.

Butterfield is a new partner at local software shop Pixel Pines, but Mines student talent keeps him close to campus. "I do what I do so I can pick out the A players. I want them to work here."

Hands-on Education Takes Root

Students from the American Society of Civil Engineers recently designed, built, and installed raised S-shaped beds at Rapid City Solid Waste Division's education center, solving both a logistical problem and sparking a passion for sustainability within the seniors and children alike who learn about compost by coaxing sprouts to life.

With ground-level gardens posing problems—it was often difficult for seniors to kneel, while visiting children trampled plants underfoot—the center's coordinator asked the university for help. Within three months, Mines students engineered the new easier access beds.



Ask the Mines Expert

Lance Roberts (CE98), PhD
Mining Engineering & Management
Department Head

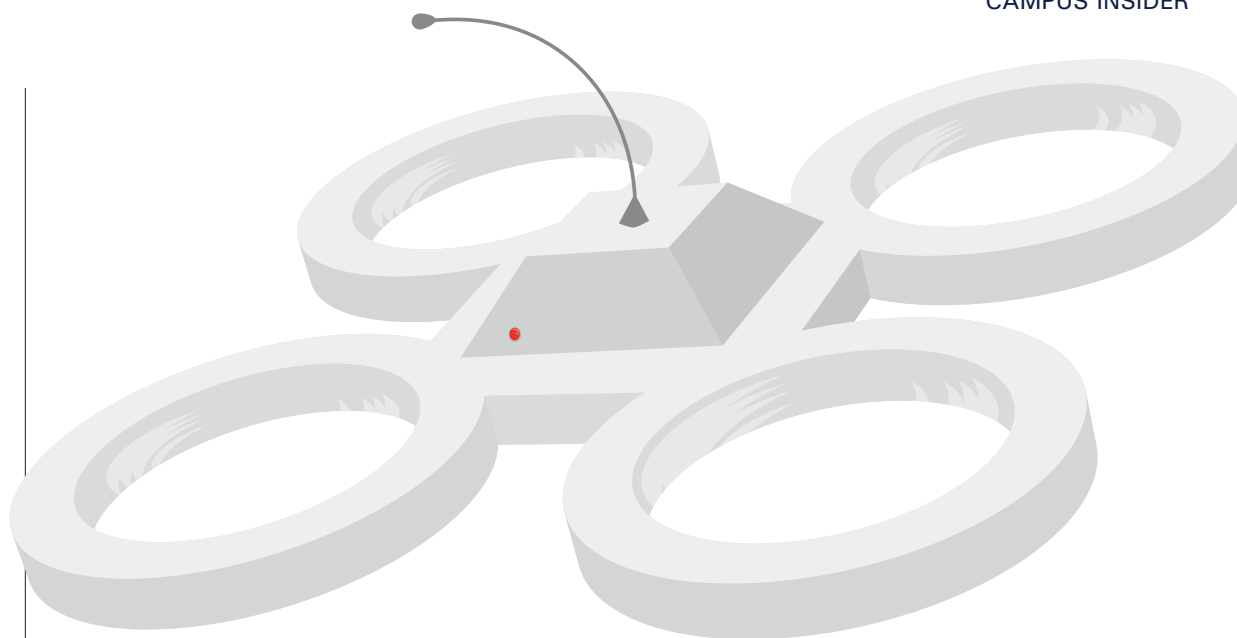
Q: How deep can you drill, and what's down there, anyway?

A: "Brine disposal wells have been drilled to depths of 16,000 to 17,000 feet. That is a depth of over 3 miles! These wells are used to dispose of brine (i.e., salt water) from oil and gas development and salt cavern development.

Over the last couple of years, SD Mines has indicated its interest in participating in a drilling demonstration project for the deep borehole disposal concept. This would involve drilling a borehole predominately in the Precambrian basement rock approximately 3.2 miles deep. The diameter at depth would be seventeen inches.

The demonstration project would focus on technology required to drill such a hole, along with the inclusion of all kinds of scientific experiments involving geophysics, very deep groundwater analysis, geomechanics, hydrogeology, and petrophysics.

This borehole would be one-of-a-kind and would likely attract engineers and scientists from all across the nation (and possibly the world) to conduct other types of experiments since we really don't know what we will encounter. It is a great opportunity for SD Mines to highlight various areas of geological, environmental, and earth science expertise, while teaming to conduct research with some of the largest companies in the world."



The Rise of Drones

Dolan envisions a future where UAVs fight fires, save soldiers, and take commerce to the skies

In 1982 Mines mechanical engineering professor Dan Dolan, PhD, was on sabbatical at IBM when a college dropout released an operating system for his pet project, the PC. Today that dropout, Bill Gates, runs the largest software company in the world, Microsoft. Dolan likens that industry-changing moment thirty-three years ago to today's rise of drones and a future where they fill the skies, an evolution he's traced through a decade of hands-on research.

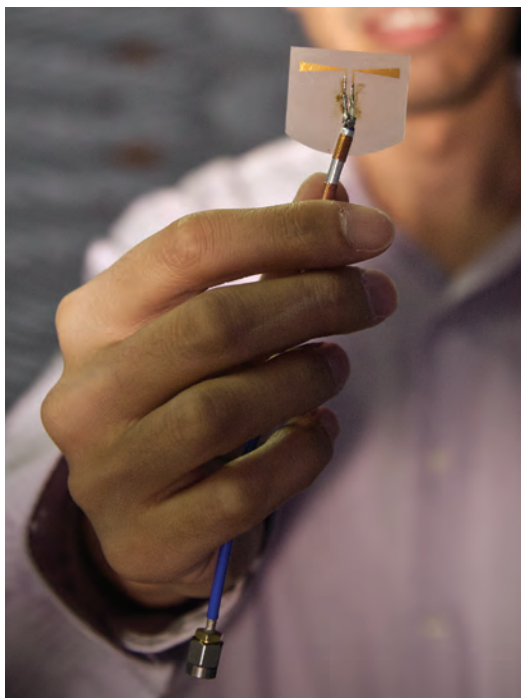
In 2003, Dolan showed a colleague at the Army Research Laboratory (ARL) the ground vehicles he and his students developed at the university's Center of Excellence for Advanced Manufacturing & Production which he directs. His ARL counterpart offered Dolan \$95,000 and a challenge: "If you were any good, you'd do a helicopter competition."

The seed money spawned Mines' Unmanned Aerial Vehicle (UAV) team and a powerful partnership with the military through the Army Research Laboratory and the Defense Advanced Research Projects Agency, which developed a radar system to help soldiers detect movement through walls inside buildings. Today his team is behind the technology that allows the sensor to acquire data while attached to a moving drone.

Exploring drone use to aid firefighters, police, and search-and-rescue, Dolan is also pursuing commercial applications in cattle ranching and power line monitoring. He's even been tapped as an advisor by the regional Federal Aviation Administration (FAA).

His students are equally versatile. UAV members spend sixteen hours on a simulator, join the Academy of Model Aeronautics, learn FAA regulations, and develop a deep understanding of ethical and privacy concerns—all before taking flight.

Dolan hopes this approach will rally public support for efficient use of drones, which have lately been at the center of public safety and privacy concern debates.



The Dawn of a New Antenna Age

Dimitris Anagnostou's team at Mines has been the first to develop new antenna prototypes using a special class of thin film material which allows them to alter shape using temperature and radiate at varying frequencies within the popular GHz range.

A single reconfigurable antenna could soon replace two or more traditional antennas, including those in cell phones, Wi-Fi, and numerous military devices.

Other prominent universities have been working on it, but the revolutionary new antennas developed at SD Mines, in collaboration with Michigan State University, were the first to be documented—in the IEEE *Antennas and Wireless Propagation Letters* in February.

They are made by integrating vanadium dioxide thin films, a type of “phase-change” material, meaning it is an insulator at room temperature and becomes metal when heated above 68 degrees Celsius. The heating-cooling cycle is repeatable and the phase-change is reversible.

A leader in the field of antenna development, Anagnostou, PhD, associate professor in the Department of Electrical & Computer Engineering, has been working on reconfigurable and tunable antennas for the past fifteen years. Graduate student Tarron Teeslink collaborated.

New Materials Will Explore Other Worlds

A multidisciplinary team of researchers from SD Mines is developing direct-write materials and electromagnetic printable spacecraft to collect information about other worlds.

Thin, lightweight, flexible sheets embedded with customized sensors and electronics will conduct future NASA space exploration. When deployed above other planets, the sheets will flutter to the surface like leaves, eliminating the need for complex landing systems and enabling humans to explore otherwise inaccessible areas such as inside volcanic craters. Upon reaching their destination, the sheets will transmit data collected during their fall and landing back to the host spacecraft.

Using direct-write technology, the team will develop printable spacecraft components ranging from sensors and antennas to solar cells and micropropulsion for steering. If successful, the micropropulsion technology developed will be the first-ever printable propellant in the world and will allow exploration across large portions of a planet at a time.

Researchers will also investigate the stability of printed components under extreme thermal cycling from -120 degrees to 100 degrees Celsius, radiation, and vacuum conditions.

The majority of the research will be conducted in the Direct-Write Laboratory at SD Mines, which has been a leader in digital fabrication for the past decade. The laboratory is capable of synthesizing inks, manufacturing materials for space applications, printing electric components and devices, and synthesizing, processing, and printing nanoparticles for propulsion and solar cells.

Researchers from SD Mines, which was awarded a \$750,000 NASA EPSCoR grant for the project, come from the departments of electrical engineering, materials and metallurgical engineering, and chemical and biological engineering. Co-investigators come from NASA Jet Propulsion Laboratory, NASA Glenn Research Center, University of South Dakota, South Dakota State University, Optomec, Inc., and Quest Integrated.

Pyramids of Gold

Teeny in nature but titanic in impact, arrays of nano triangles of gold, known as “metasurfaces” are among the structures being developed inside South Dakota Mines laboratories that could help make cell phones, televisions, and other light-emanating sources brighter while using less energy.

Jon Fisher, nano doctoral student, working with Stevens High School student Shaunnak Shende, and advised by Professor Steve Smith, PhD, director of the nanoscience and nanoengineering program at Mines, is exploring the properties of these metasurfaces with potential applications in display technologies. The work has been funded by multiple NSF, NASA, and DOE grants.

Through the study of how phosphors interact with metasurfaces, researchers can enhance their emission properties, thereby reducing the amount of energy required to create a display of a given brightness. Ultimately, the research could lead to displays thirty times brighter, or displays requiring one-tenth of the energy required by current technologies.

Ready to Launch

Meet the Mines entrepreneurs spinning out the hottest companies of 2015



Recently featured as #1 return on investment by the *Wall Street Journal*, South Dakota Mines is often recognized for its outstanding education. With researchers-turned-business leaders who have dominated the Governor's Giant Vision Competition three years running, the university is now also gaining prominence in the new market of fast-tracking start-ups and entrepreneurial launches. Meet the breakout class of 2015: *E. coli* test strips, mobile nuclear power plants for disaster relief, and spray-on metal that's saving the military billions of dollars and putting critical equipment back in the skies.

In the past three years, Mines has successfully filed forty-six invention disclosures, and one of the patented technologies is experiencing rapid growth. Winner of the 2015 Governor's Giant Vision Business Competition, VRC Metal Systems is the only hand-held, high-pressure cold-spray company in the world.

A 1980s technology born out of the Cold War, cold-spray was brought to the US after the fall of the Berlin Wall, incubated in the Army Research Laboratory (ARL) and developed in partnership with SD Mines. In 2010 Christian Widener, PhD, became director of the Arbogast Materials & Processing Laboratory (AMP) at Mines and quickly recognized the potential for this technology that accelerates metal powders through a supersonic nozzle at rifle speeds to build up metal onto surfaces.

Shortly thereafter came VRC's first big break with the discovery of a \$300 million problem.

Ellsworth Air Force Base has a fleet of legacy aircraft over thirty years old, which are often grounded for lack of replacement parts or suitable repair techniques. B-1s in particular can develop loose fasteners on worn access panels that prevent them from flying. The company that produced the parts estimated a \$200,000-per-panel price tag and a two-year wait.

But in a matter of two weeks and for a few thousand dollars, VRC Metal Systems, working with SD Mines and private company

MOOG, puts the bombers back in the skies. Its cold-spray technology restores the proper size to the fastener holes with strengths nearly identical to the base metal—without melting the part or releasing toxic fumes.

Now VRC is readying to expand its business by launching a multimillion dollar venture integrating cold-spray repair technology as an approved practice throughout the Air Force, potentially saving \$10 billion in maintenance costs by repairing parts instead of scrapping and replacing them with new ones.

In June VRC was named Black Hills Community Economic Development Start-Up Business of the Year for 2015. VRC employs thirteen full-time and next year is expected to double its workforce.

Also a Mines start-up, Module Innovations, the brainchild of graduate students Vivek Agarwal and Sachin Dubey, is set to hit the \$221 billion food processing industry with its product Bactisense™, a color-changing strip that detects harmful bacteria like *E. coli* in food and water within minutes.

Junior Conrad Farnsworth's company, Farnsworth Downs Technology, winner of this year's Giant Vision Student Competition, designs portable molten salt reactors. These rugged power generators can desalinate water and produce emergency power during disasters or grid failures.

Faculty start-up Nanofiber Separations, is revolutionizing the biopharmaceutical, blood products, and air purification industries, while alumnus-run Calx Aqua sets the new standard in water treatment. Mines' invisible QR code anti-counterfeiting technology is also on the commercialization fast-track.

The increase in economic development emerging from Mines has led to a new Blackstone Foundation-funded accelerator for high-growth potential projects and technology transfers into the marketplace taking place this summer on campus.



THE SPIRIT of giving back

Don Range (EE51) was born a Hardrocker. Well, nearly. From the age of three, he knew he'd call South Dakota School of Mines & Technology home. A lifelong supporter of the university, he's been faithful ever since.

Range's Hardrocker heritage runs deep. His parents were devoted boosters despite never attending the university.

Range enrolled as a freshman at the age of eighteen, when the student body was under one hundred, then joined the Navy to fight in World War II. After V-Day, a flood of older, more mature veterans enrolled, all singularly focused on getting their degrees. "It was crowded and competitive. We were here to get an education," Range recalls.

His brother **Paul Range** (EE47), a returning veteran, graduated with a degree in electrical engineering and a job with Motorola. Four years later Range followed in his footsteps, eventually earning a master's at University of California, Los Angeles, in 1961. Both eventually worked for Hughes Aircraft Company until retirement.

In 1991 Range married Marge in Minnesota after both lost their spouses. They divided their time between California and Minnesota for three years before finally deciding to move back to Hardrocker country in the Black Hills. "She didn't want to live in Los Angeles, and I didn't want to live in Minnesota," Range explains.

Once back, the Ranges threw themselves into campus life. Their enthusiastic support of athletics has been unwavering for the past twenty-five years. Today, the couple can be found courtside at

home basketball games or watching football from the parking ramp near the fifty-yard line, a prime spot inherited through Range's aunt, whose husband had been an equipment manager.

Range's aunt had also established a Mines athletic scholarship, and after his parents' deaths, Range founded another in their name, the Edith & James Range Scholarship. Between his parents' memorial scholarship and the Range's \$5,000 donation to the Harvey Fraser Scholarship Fund, generations of scholar-athletes have been able to pursue their goals.

Like everything the Ranges do, their giving has a personal touch. They meet each recipient, check in on their progress, and of course, cheer at every game.

This year's recipient was basketball player Brian Orr from Macomb, Michigan, where Range was sent on a field assignment early in his Hughes Aircraft career. Grateful for the scholarship, Orr, whose home is eighteen hours away, is happy to see their familiar faces in the stands. "I wave to them in warmups. I'm so appreciative to have met them."

The Ranges echo the sentiment. Their grandson is a senior, and they have a soft spot for all Mines students. Expressing a wish for more alumni to give to scholarships, Range hopes to inspire the passion his mother had for Mines. His motivation he admits isn't entirely academic. "Alumni have good salaries. If more gave we could build a great team here."



New President Builds on Mines Foundation

Joel Kincart has arrived on campus as the new Foundation president just in time to launch a capital campaign to strategically address funding university priorities over the next five years. Kincart talks about what the future holds for the Foundation and the South Dakota School of Mines & Technology and offers insight about his family and what makes him tick.





THE RACE IS ON

**As the rest of the world
sees it, dark matter is a
mysterious, inconceivable
galaxy away.**

But physicist Richard Schnee has dedicated his life's work to the detection of ever-elusive dark matter, believed to make up 80 percent of the mass of the universe. Even though he can't see it at all, Schnee views the search for and study of dark matter as key to understanding the inner workings of the cosmos, its history, and its future.

"Dark matter is what keeps galaxies together. To understand dark matter combines understanding both the laws of particle physics and the history of the universe. That's a compelling combination. We can't really fully understand anything unless we understand dark matter," he says, motivated by the belief that the answer is relatively accessible.

“We can find it in our lifetime, at least if we’re lucky. We might find the answer is that it’s something we can’t detect, but hopefully that’s not the case.”

His quest to unlock the keys to the universe is why he left his faculty researcher position at Syracuse University a year ago to join the South Dakota School of Mines & Technology, where he now has the opportunity to expand his dark matter research a mile below the earth’s surface at the Sanford Underground Research Facility (SURF) in nearby Lead and help shape the university’s new physics doctoral program.

“It comes down to SURF being deeper, and the proximity of the university to the Sanford Lab was absolutely huge,” says Schnee, PhD, adding he was also attracted by the opportunity for a leadership role in Mines’ physics program. “In a sense it’s about being on the ground floor for the great increase in underground physics research that is going to be able to take place here. All this is ultimately enabled by the good relationship the university has with Sanford.”

Schnee is among four faculty researchers hired over the past two years to support the new PhD program. Like Schnee, who is involved in two of the next-generation underground dark matter searches—the Large Underground Xenon-ZEPLIN, or LZ, at Sanford and the Super Cryogenic Dark

Matter Search (SuperCDMS)-SNOLAB collaboration in Ontario, Canada—all members of Mines’ newly formed team bring firmly established, significant relationships with high-level, groundbreaking experiments.

Mines’ existing leadership roles in these prominent collaborations immediately raises the stature and growth potential of the university’s new physics program.

“The department has hired good people over the last sev-

“There is a very real chance that in the next ten years the stuff that makes up most of the mass in the universe is going to be discovered right near here.”

eral years, and combined with the incredible resource that is SURF, we have a competitive advantage over everyone else,” Schnee says. Within the first ten months of the team being together, they were awarded a \$1.1 million grant from the Department of Energy, Office of High Energy Physics, to make significant contributions to dark matter and neutrino oscillation experiments by leading work on calibrations, analysis, and reducing backgrounds due to radon daughters and dust. Improved calibrations are critical to the success of the experiments. This summer Schnee was awarded a

\$439,000 National Science Foundation base grant over three years for his work on the SuperCDMS experiment.

Other new faculty researchers and their involvement in major experiments:

- Luke Corwin, PhD, who came from Indiana University and had been based at the Department of Energy’s Fermi National Accelerator Laboratory in Batavia, Illinois. Corwin is involved in the Deep Underground Neutrino Experiment

the University of Chicago. Reichenbacher is involved in LZ at the Sanford Laboratory, as well as DUNE.

- Frank Strieder, PhD, who came from Germany and, for the previous ten years, held leadership positions in the international Laboratory for Underground Nuclear Astrophysics in Gran Sasso, Italy. Strieder is principal investigator of the Compact Accelerator System Performing Astrophysical Research (CASPAR) project at the Sanford Laboratory, which is funded through the South Dakota Science and Technology Authority (SDSTA).

Additionally, Mines astrophysicist Xinhua Bai, PhD, who came to the School of Mines in 2009 from the University of Delaware because of the promise of a physics doctoral program,

is involved in both the current LUX project and its next generation LZ. Bai is a member of the LUX executive board. He is also involved in DUNE and the IceCube experiment at the South Pole, and has been involved in South Pole Air Shower Experiment and the Antarctica Muon and Neutrino Array (AMANDA) project.

“We are aligning our research program to take advantage of the tremendous capability the Sanford Underground Research Facility affords South Dakota,” said university President Heather Wilson, who sits on the SDSTA board. “We’re very proud of the research

(DUNE), which will involve the world’s highest-intensity neutrino beam 800 miles between Fermilab and cryogenic far detectors installed deep underground at the Sanford Laboratory; and NOvA, which consists of two particle detectors between Fermilab and the Ash River Laboratory in Ash River, Minnesota.

- Juergen Reichenbacher, PhD, who came from the University of Alabama and was previously a post-doctoral appointee of the High Energy Physics Division at Argonne National Laboratory contracted by



Matt Kapust, Sanford Underground Research Facility

team assembled at the university and very excited about the future of physics research here at Mines.”

The growing prominence of the physics department has required an expansion into the Foundation building adjacent to campus on East Saint Joseph Street. Physics offices and laboratories now encompass the entire ground floor of the building.

Some laboratories, such as Bai’s, are located in the physics department, whose home is in the Electrical Engineering and Physics Building off the Quad.

The new doctoral program will enroll twenty-one students in the fall of 2015, while undergrad enrollment will top fifty students next semester.

Success of the first-ever “Conference on Science at the San-

ford Underground Research Facility” hosted on campus in May has increased exposure to the university’s physics research endeavors and alignment with opportunities at the Sanford Laboratory.

Corwin, who along with Schnee organized the conference attended by 121 scientists from throughout the world, says in addition to highlighting the scientific endeavors at Sanford, the conference was an excellent recruiting tool.

“The overall goal was really just to bring together all the different sciences being done at SURF, because there is such a variety. Most people think about it as physics, and dark matter is certainly the most famous, because that’s one of the experiments happening right now, but we wanted our

attendees to learn about all of the exciting work being done in geology, biology, materials science, and other fields too,” says Corwin, adding the hope is participants from national and international institutions will advise their students to consider Mines for their doctorates.

For sensitive research experiments requiring the protection from cosmic rays that is provided by tons of deep underground rock, there is no laboratory in the United States better than the Sanford facility, Schnee says. Major dark matter experiments are also being conducted or planned in Italy, Canada, and other countries.

When it comes to detecting dark matter, Schnee engages the race with eyes wide open.

“I am constantly aware that the

particular types of dark matter experiments we’re doing could end up not seeing anything. But even if we don’t detect anything, I think it would be useful to do the experiment and learn that dark matter isn’t of this detectable form, that it’s worth spending all my time and effort even if that is the outcome,” Schnee says.

Still, there remains a good chance for detection, and that belief drives Schnee and those like him in their life’s mission.

“There is a very real chance that in the next ten years the stuff that makes up most of the mass in the universe is going to be discovered right near here, just right over the hill. That’s very exciting, and I and the other faculty members have a big chance to be a part of that.”

GOLD RUSH

MET 220 Revisits Smelter Hill

Hiking up the hill behind Dunham Field at O’Harra Stadium, a glint stops her gaze cold. Anna Haydock hunches over, scooping a pile of dirt into her palm. Dropping it into a bag, she brushes off her hands and stakes a small, orange flag into the earth. Haydock isn’t searching for fossils, but fortune. There’s gold in these hills.

A sophomore metallurgical engineering student, she’s about to see history come alive. This is MET 220, a mineral processing and resource recovery course taught by **Jon Kellar** (MetE84), a Mines alumnus turned professor who turned his school-day memories into a modern-day extractive metallurgy lab.

Growing up in Rapid City, and later as a student, Kellar often walked the hill bordering campus, stepping over crumbling brick peeking through the grass. On a hunch, he recently collected a sample from what is known as Smelter Hill, hoping, after processing, the remnants of its namesake would prove true. A few weeks later he struck gold.

Smelter Hill was one of the last vestiges of the rush for riches a century earlier in the Black Hills. From Deadwood alone miners would produce 10 percent of the world’s gold supply for the next 125 years. By the 1900s even gold chemically bound to rock could be freed through chlorination, smelting, and cyanide processes. A deluge of gold processing facilities flooded the area, including the smelter built just above the third tier of present-day O’Harra Stadium.

Business was booming for the smelter’s operators, the Horse Shoe Co., and even campus couldn’t ignore the golden lure. The newly minted Mines *Aurum*, a nod to the mineral’s periodic symbol, reported that by the number of cars of ore streaming down the hill daily, the smelter would run indefinitely. A partnership bloomed as early Mines metallurgical engineers began working for Horse Shoe, refining their expertise a stone’s throw from campus.

But competition was stiff and with gold prices fixed, only the Homestake Mine could endure. Horse Shoe shuttered its doors in 1912. By 1918 only the frame remained.

SD Mines however continued to serve as a valuable resource for the minerals industry. Today it’s one of only five universities

nationwide offering degrees in metallurgy, mining, geology, and geological engineering.

The gold among the rubble offers an ideal opportunity for Kellar’s students to get the hands-on experience and equipment know-how industry craves. Collecting samples from Smelter Hill, students use comminution and separation techniques to concentrate gold from the ore.

While even the biggest find last semester amounted to just a few flakes, the class is paying off in other ways. Haydock will intern at Freeport McMoRan, one of the globe’s largest gold producers. She’ll work at the crush conveyer, a unit she chose because of the class. That’s why Freeport chose her, too. “I have equipment knowledge now. I know what things are; they’re not just a name, which impressed Freeport,” Haydock says.

As one of twelve women in her major and the only minority,

Haydock’s not so different than the prospectors of long ago, fearlessly blazing paths where few tread before. That’s why her ambitions are equal parts career- and advocacy-driven. “I’ll become an engineer but my ultimate goal is to become an activist and get

more women and minorities into STEM (science, technology, engineering, and math).”

Some of that challenge will simply be showing them where to look. “I’ve known since nine I wanted to be an engineer because of my fascination with why buildings don’t topple over. I was going to be a civil engineer. It was the only one I knew. Then Admissions suggested metallurgical engineering.” The rest is history.

Classmate William Bane’s background is similarly unique. After twelve years in the military, he earned a diesel degree and went to work at Caterpillar in mechanic failure analysis. He came to Mines to pursue mechanical engineering, but once he discovered metallurgical engineering there was no looking back, and classes like Kellar’s have only cemented this sophomore’s goals. This summer he is interning at Nucor, the second-largest steel producer in the US.

View current and historic photos at www.sdsmt.edu/hardrockextra.

The gold among the rubble
offers an ideal opportunity for
Dr. Jon Kellar’s students.



FIVE-YEAR REUNION

More than 1,200 School of Mines alumni and their families united on campus July 8-11, swapping old stories and making new friends at the traditional five-year all-school reunion.









View more photos at www.sdsmt.edu/hardrockextra.

1930s

MEMORIALS

Albert Hamway (EE35)

1940s

Lloyd Darnall (CE44) had a pacemaker installed a few months ago and should be ready to go. He is still working for Habitat for Humanity. They have built fifty-seven houses in Brookings County since 1995. They average three per year.

Gerald Lammers (ChE44) is sorry to say his beloved Anne passed away.

Lowell Ploster (EE49) has been doing a weekly Bible study in a Minneapolis prison for more than twenty-five years. He saw his best School of Mines friend, **Harry Head** (EE49), in the *Hardrock* at age ninety-one. He wants him to know he is ninety-two.

MEMORIALS

John T. Colgan (EE42)

Robert K. Collins (MinE49)

Merle E. Crew (Geol42)

Patrick Daugherty (Ex44)

Edward R. Gamberg (MetE42)

James D. Grode (EE40)

Thomas K. Keenan (Chem49)

Olaf E. Larsen (ME49)

Albert D. Schmidt (EE49)

John W. Zambo (EE49)

1950s

Frederick Beeman (GeolE50) is still hanging around at ninety-two years. Both of his girls live in Kingman, Arizona, near him. The weather is great and he and Bette are excited to have three grandchildren and five great grandchildren. Their health is pretty good.

James Brooks (Geol56) spent the summer of 2014 working as a guide at the Quincy Mine in Michigan.

Alva Dougal (CE50) celebrated his ninetieth birthday last October; he is still driving and painting. He notes he does not hunt pheasants and deer anymore, but he misses it!

John “Duff” Erickson (MinE55) has downsized to a villa in West Hills Village in Rapid City. He and Bettie are enjoying the ease of shutting the door and taking off to visit friends and family.

Harlan Hartman (ChE56) is enjoying retired life—Starbucks and Bible study. He and Marie celebrated their sixtieth wedding anniversary in November.

Bruce Johnsen (CE59) is still enjoying a nice mix of work and play. He was looking forward to reconnecting at the Reunion.

Karen and **Alan Liffengren** (ME57) have decided to move back to the Midwest, after sixteen years in Arizona, to be closer to their children and grandchildren. They are considering northeast Arkansas near Jonesboro and plan to move late spring.

Carole and **Donn Lobdell** (ME58) got together with his cousin **Bob Bangs** (CE53), Bob's wife Mary Lou, several of Mary Lou and Bob's children and grandchildren in March. It was a few days after a large redwood had dropped a substantial branch into a roof section of the Bangs' home in Healdsburg, California. Bob is a retired Bridge Engineer from Caltrans. Donn is retired from Alcon Laboratories.

Jan Matousek (MetE59) lost his wife, Mary Beth, on January 25, 2015, after battling pancreatic cancer for more than three years.

Lavalle Ptak (Phys56) celebrated his eightieth birthday July 12, 2014. His family is great; he has eight grandchildren. He and Pat celebrated their fifty-fifth wedding anniversary May 15, 2014.

James Richardson (Chem52) and Eileen had all of their family present for Christmas. They enjoyed reminiscing, talking, and informing the youngest generation of their “ancient history” and the mysteries of the K & E slide rule.

Donald Schlegel (EE56) and Carol are enjoying life in a retirement community. It keeps them busy. He tries to hike in the mountains as often as possible.

Roy Strom (EE53) and Peggy downsized and moved into an apartment in the spring. They have had to dispose of their fifty plus years of treasures.

Edward Tegland (GeolE59) is still working. He celebrated his fiftieth wedding anniversary in January.

Stuart Ulfers (EE58) and Frances are still enjoying good health. He sends his best wishes to all for the remainder of 2015.

MEMORIALS

Francis W. Bakula (EE58)

Harold L. Brandeberry (EE52)

Oliver E. Byrum (MinE58)

Fred E. Fankell (CE51)

Richard B. Haigh (EE56)

Roy W. Hanson (ME51)

Floyd T. Harris (ME58)

George R. Hokenstad (EE52)

Harvey J. Keating (EE59)

John A. Keller (ChE52)

Myron R. Kidner (ChE50)

William R. Sacrison (GeolE53)

Arnold E. Ypparila (EE51)

1960s

Vincent Bertolotto (ME67) and his wife, Liz, are planning many trips for 2015 including a Panama Canal Cruise, March in Florida, fishing in Northern Wisconsin, visiting relatives in Lead, South Dakota, and visiting the grandkids in Oklahoma and McHenry, Illinois. He is enjoying retirement.

Paul Besselievre, Jr. (EE64) visited Bonnie and **Dave Mikkelson** (Math62) in Indianapolis, Indiana. He and Carol last saw them in Casper, Wyoming fifty-two years ago on the second day of the Mikkelson's honeymoon and the seventh day of Paul and Carol's. Paul and Dave sang in the "Enginairs" Quartet at Mines. It was a great reunion and thanks go out to Dave and Bonnie. (Note: We were sorry to hear of Paul's sudden passing recently after receiving this update.)

Carl Coad (Math60) is enjoying retirement and attending grandkids' events such as plays, sports, Irish Dancing, etc.

Thomas Crooks (GeolE66) notes raising gourmet garlic is going well. Life is beyond good!

James Crouch (MinE68) and Melisa attended Mary Lou and **Pete Oslund's** (MinE69) forty-fifth anniversary at their home near Tetonia, Idaho. It was a great time renewing old friendships that included **Tom Kuhl** (GeolE68).

Alan Freiberg (ME68) is still flying, forty-eight years thus far. He notes, after fifty years you are a "Master Pilot." He flew his airplane to Lincoln, Nebraska last August for his aunt's hundredth birthday. He also flew to Oklahoma City to visit his son, Trent, and three grandchildren.

James Fry (ME64) is doing well and still working for Los Angeles County part time. He is doing some traveling, playing some golf, and grandpa duties.

Ed Heinrich (CE66) participated in the Class of 1965, Fifty-Year Graduate Reunion. He notes he had a wonderful time and enjoyed how friendly everyone was. He relates everyone should participate given the chance. He is glad he did not miss it in spite of the May snowstorm.

Fred Hornstra (EE60) is sad to report his dear wife of sixty-three years, Ila, died peacefully in her daughter Karla's arms on February 23, 2014, after six weeks in a nursing home.

Andrew M. Johnson (MetE64) had a wonderful 2014 with the birth of grandson Andrew Michael Wolcott in May. He joined his big sister Anna Lynn who turned four this year.

Gary Johnson (Geol63) is sad he missed the July Reunion. He headed for paleontology conferences (2) and related field trips (4) in Australia starting in late July. He is researching shark fossils and is still all too active.



Gene and Barbara McPherson

Gene McPherson (EE68) was recently married to Barbara Howe in Punta Gorda, Florida. They met on eHarmony. Winters will find them in Florida and summers in Sturgis. And the Reunion, again, found him in close proximity to the plaque-laying efforts on M Hill in July 2015.

Gary Keffeler (ME68) is still living on the green side of the grass! He and Jacquelyn are surviving, but not venturing too far from their home in Illinois. They are touring across Canada from Calgary to Niagara Falls this summer. They are sorry they missed the reunion.

Bruce Orton (ME61) is celebrating the "spirit of '76" (his present age) by consulting with and directing the refurbishing of a recent acquisition of Cutec Industries, Inc. in Tulsa, Oklahoma. Tulsa still exemplifies the glory years of petroleum prominence in the world; he notes it is a fantastic city and area. He and Vicki have enjoyed their seventeen month sojourn on the project.



President Heather Wilson and Marion R. Hansen (CE69)

Marion R. Hansen, PhD, (CE69) received the Guy E. March Medal during the Spring 2015 Commencement ceremony. After earning his bachelor's degree in civil engineering in 1969, Hansen earned a master's degree from Mines in 1973 and in 1985 rejoined the School of Mines family as a faculty member in the Department of Civil & Environmental Engineering.

He served for many years as faculty advisor to the student chapter of the American Society of Civil Engineers (ASCE), and advocated for student participation in the concrete canoe and steel bridge regional and national competitions. Under his guidance and leadership, the Mines team won the ASCE National Concrete Canoe Competition in 1995 and received the prestigious Ridgeway Award as the best ASCE student chapter in the United States in 1998. Hansen was recognized by ASCE as the top faculty advisor in the nation in 1996.

In the 1999-2000 school year, Hansen developed a dialogue with the Mongolian University of Science and Technology and took a one-year sabbatical to the university in 2001-2002. This relationship between the Mongolian University and the School of Mines continues today.

He also previously served as a member of the Board of Directors of the Alumni Association and is a member of the Lifetime Contributors of the Alumni Association.

Jerry Pekarek (ChE66) and his wife, Judy, had a busy year of maintaining landscaping for their neighborhood park and Church. They also removed a lot of downed trees in the Sandia Mountains.

Allan Peterson (Math63) and Tina celebrated their fiftieth anniversary by going on a family Disney cruise. Their three kids, spouses, and eight grandchildren all had a great time. In May they visited Al's brother **Ron Peterson** (Chem71) and his wife, Elly, at their home in Hurricane, Utah. They took them to Zion, Bryce, and Grand Canyon national parks. Put these parks on your bucket lists.

Herbert Reichert (Math66) spent a Reichert family weekend in Lusten, Minnesota, (along the North Shore) in September 2014 to celebrate his seventieth birthday, their forty-fifth wedding anniversary, and several fall birthdays. The weather was great and everyone had a wonderful time.

Roger Roehl (ChE66) and Myrna just downsized from a house to a condo. He is enjoying retirement and still works with the Builders for Christ building and remodeling churches and schools. He plays a little golf and winters in Cape Coral, Florida—no snow shoveling there.

Dean Shroll (EE67) retired in April 2014 after forty-seven years with the same company. He started in 1967 with Iowa Public Service, and after a few mergers and a couple of years with the Army Signal Corps ended with MidAmerican Energy. They have five grandchildren, ages four to eight, to keep them busy. They hope retirement will get them away from the Iowa winters.

John Sibert, III (Chem62) is the mayor of Malibu as of January 12, 2015.

Thomas Snyder (ME62) along with his son and grandson enjoyed biking the Mickelson Trail and visiting the Mines campus last summer. They also visited **Tom Monheim** (EE62) in Rapid City and **Robert Zafft** (ME63) while passing through Denver.

Marlyn Stubbe (Chem68) resides at the Palisade Manor thanks to advanced Parkinson's disease. In spite of the disease, he plans to enjoy his retirement years. His wife is in their nearby home and his children live in West Virginia. He plans to see them as much as possible.

John Synhorst (EE68) was in China this spring; he and Anneliese took a Yangtze River Cruise, Great Wall, and Terracotta Soldier visits. In September, they visited the Black Hills for John's fiftieth high school reunion. They also saw family in Rapid City and Mitchell. They traveled to Germany in October for a surprise birthday visit to their nephew. They will see what next year brings—"July in Rapid City?"

Ken Trompeter (ME62) laments he was not able to make the July Reunion.

Brian Tucholke (Geol68) continues to enjoy traveling with Anita. This year travel led to Russia and Mexico along with numerous visits to their daughters and three granddaughters in New Mexico.

MEMORIALS

Paul E. Besselievre, Jr. (EE64)

Arne Fuglum (CE62)

Frederick Pfeiffer (EE63)

Thomas J. Richter (EE64)

Charles T. Schmidt (MetE63)

Robert A. Skramstad (GeolE65)

1970s

Alan Anderson (ME71) retired from his position as District Ranger of the Buffalo Gap National Grasslands in Wall, South Dakota. Their children, **Curtis Anderson** (IE08) and **Heidi Schram** (CE00), are working as project managers for engineering companies in Denver. Both Heidi and Curtis and their spouses are expecting their first two grandchildren in January and February 2015. Alan and Susan look forward to spoiling the newcomers; both girls.



Tom Zeller (ME70), Walt Jones (EE75), and President Heather Wilson

Walter D. Jones (EE75) was unable to receive his 2014 Distinguished Alumni Award (DAA) last December at the fall commencement in Rapid City. Past Alumni President, current Executive VP, and 2011 DAA recipient **Tom Zeller** (ME70) and SD Mines President Heather Wilson were more than willing to present Walt his award at the SD Mines Foundation Board of Trustees meeting in Phoenix, Arizona, this past February.



Wayne Olfert (EE78) with incoming freshman Blake Gagnon

Wayne Olfert (EE78), senior staff engineer with Siemens in Brooklyn Park, Minnesota, was one of more than fifty alumni who presented freshman scholarships this spring at high school events. Blake Gagnon from Kimball High School is one of approximately seventy incoming freshman. Sincere thanks go to all the alumni volunteers for helping welcome these incoming freshmen scholars.



Merle Symes (ChE73) with incoming freshman Luke Hayes

Merle Symes (ChE73), CEO at Graematter, Inc. was one of more than fifty alumni who presented freshman scholarships this spring at high school events. Luke Hayes at Governor French Academy in Belleville, Indiana, is one of approximately seventy incoming freshman. Sincere thanks go to all the alumni volunteers for helping welcome these incoming freshmen scholars.

William Betten (Phys77) is still enjoying the Minnesota winters and building a new business in the medical/life sciences area for his company. He has traveled worldwide to write and lecture in many venues. He remains very involved in engineering education through engagement with local universities.

Jim Crompton (MetE77) retired after forty years in the steel industry. He finished his career as GM/VP of Geldan Rancho Cucamonga. Last summer he visited family and friends back east, including Jane and **Dave** (ChE82), **Tom** (ChE90), **Andy** (ME07), **Josh** (ME07), and **Bob Crompton** (ME10).

Kim Haarberg (MetE79), along with **Alan Larson** (ME79) and **Mark Brown** (ME79), watched Payton Manning and the Denver Broncos set the all-time touchdown pass record. **Tom Winkler** (CE79) was going to join them, but they sold his ticket.

Joan Howard (Phys76) is semi-retired in Hot Springs, South Dakota. She is trying her hand on a battery start-up company. She would love to bring some good jobs to the Hills.

Mark Howe's (Phys77) wife, Margaret Cortese Howe, died unexpectedly on February 20, 2015. They enjoyed twenty-eight years of marriage. They reside in Chapel Hill, North Carolina. He has been in the physics department at the University of North Carolina for the past eight years.



Dolores and Roger Kiel (GenE58), Carmen Adams (ChE75) and John Adams in Sedona, AZ

Carmen Adams (ChE75) had a great West/Southwest tour in November with John. They visited alums **Anita Freeman** (EE76) in California, Dolores and **Roger Kiel** (GenE58), and Connie and **Hal Nelson** (GenE58) in Sedona, Arizona. She was asked several times about her "Mines" visor.

Patricia (ChE76) and **David Knox** (ME75) are back in the US after six years overseas. Their new home is only three houses down from their delightful grandsons. They are also enjoying their children and son-in-law.

Margaret (MetE77) and **Wayne Larsen** (GeolE76) welcomed grandson number two, Holden Schmidt, in September. He joins older brother Archer Jens, age two.

Larry Messinger (MinE74) retired from industry, but still consults. He is a volunteer supervisor for disaster relief services for the American Red Cross. Larry struggles to find sufficient time for “real” retirement things like keeping up with his children and their families. He is very proud of his wife, Sherry, who belatedly earned her BS and MS degrees and continues to volunteer and work for the local CASA program.

Paddy Moore (EE71) is retired from Sturgeon Electric and is now teaching and training project engineers and managers about contracts, scheduling, and other management skills. He notes it is great being around the younger generation.

Douglas Schultze (ChE78) is officially retired. He has a house in Tulare, South Dakota, but spends most of his time in Fort Worth, Texas.

Ronald Oney (Math72) and Sharon appreciated the wonderful winter weather in Rapid City! 2014 was a challenge. At the end of July Ronald went down with a serious attack of pancreatitis and was diagnosed with terminal cancer. The second half of 2014 was dedicated to getting healthy. He encourages old friends to connect and doesn't expect to leave before the end of the year.

Dee and **Ray Symens** (MetE73) have moved from Augusta Pines Golf Course in Spring, Texas, closer their two sons and their families. They are living in a smaller house that is built on the back part of their son's acreage in Conroe.

They have built a new house on the front of the lot. They still come to Kennebec and Britton, South Dakota, in the summer with their RV and visit family and friends and golf at the Chamberlain and Roy View Golf Clubs. They also visit family in the Black Hills a couple times a year.

MEMORIALS

Jay R. Gaudig (EE71)

Roger F. Hawley (CE72)

Ronald E. King (CE78)

Michael L. Marler (CE71)

Henry Waldman (CE77)

1980s

Douglas Feterl (ME82) has been promoted to president of West Plains Engineering, Inc.

Michael Fuhs (MS Mtro86) is proud of his son, Alexander, for representing South Dakota in the National Junior High Barber Chess Championships in Madison, Wisconsin, and Orlando, Florida.



Paris Briscoe (ChE86) and Chris Korpi (GeolE83)

Paris Briscoe (ChE86) is saddened at the loss of **Chris Korpi** (GeolE83) last year. He had not seen Chris in over twenty-five years, though they spoke once a year on their birthday, January 22nd. Last June, Chris made the trip to Aberdeen from his home in California for a backyard party Paris and his wife hosted. They followed with a week in the Black Hills with Chris as the tour guide for a group of about forty people, mostly business associates of his from tribal councils and tribal casinos across the US. Briscoe's family joined his group and says it was great to see Chris in his element teaching about the history and geology of the Black Hills. Chris even arranged for the group to be driven up on top of Crazy Horse Memorial where they spent time on the arm.

Jack Hazel (ChE85) is looking forward to being back in the fall recruiting at Mines for Exxon Mobil. His office has moved North of Houston into a new campus in The Woodlands, Texas.

Mary Nelson Himmler (Chem80) feels blessed to provide care for severely injured service members, but prays for the day when her services are no longer needed. She thanks Mines for being veteran friendly and supportive.

Craig (ChE82) and **Kate Holzhauser** (ChE82) have been busy the past couple of years. Craig retired from BP in 2012, and their family relocated to Switzerland as a result of a job transfer in Kate's role at INEOS Nitriles, where she was the Vice President of Operations. In mid-2014, she retired from INEOS, and accepted a new role as the Vice President of Environmental, Health, Safety and Security for Chevron Phillips Chemical. They have one kid "off the payroll" now, and working in the "family profession" as a chemical engineer, and their twins have just completed their first year of engineering school. Life is good!

John Jacobson, II (ChE81) is living in Bangalore, India helping to build and start a new corn plant in Davengere, India.



Rick Christensen (GeolE83) with incoming freshman Hannah Moen

Rick Christensen (GeolE83), Senior Project Manager for Blattner Energy, Inc. in Avon, Minnesota, was one of more than fifty alumni who presented freshman scholarships this spring at high school events. Hannah Moen from Saint John's Preparatory School in Collegeville, Minnesota, is one of approximately seventy incoming freshmen. Sincere thanks go to all the alumni volunteers for helping welcome these incoming freshmen scholars.

Mitch Kannenberg (GeolE89) was named associate vice president by Leggette, Brashears & Graham, Inc., a professional groundwater and environmental engineering services firm. He is a licensed Professional Engineer, and was recently elected to the American Water Works Association (AWWA) Board of Directors, where he is serving a three-year term. He was awarded the George Warren Fuller award for distinguished service in the water supply field in 2011, and is a past Chair of the South Dakota Section of AWWA.



Marty Jackley (EE92) with incoming freshmen Jesse Williams, Micah Howard, and Matt Darnall

Attorney General of South Dakota **Marty Jackley** (EE92) was one of more than fifty alumni who presented freshman scholarships this spring at high school events to approximately seventy incoming freshmen. Pictured above with Marty are incoming freshmen Jesse Williams, Micah Howard, and Matt Darnall from Riggs High School in Pierre, South Dakota. Sincere thanks go to all the alumni volunteers for helping welcome these incoming freshmen scholars.

Joseph Odegaard (GeolE84) and Juli continue to enjoy living in Rapid City and in their future retirement home. He works for Gilbane Federal at Ellsworth AFB on a long-term environmental project. They are down to one child at home. The other three have married and joined the workforce. They are blessed with three grandchildren; two in Birmingham, Alabama, and one in the Rapid City area.

Brian Vognild (MinE83) retired from the Air Force Reserve after thirty plus years.

Todd Williams (GeolE83) has joined TRC Companies, Inc. as Chief Marketing Officer. In this role, he will lead the Company's strategic marketing, business development and industry focused initiative teams to maximize new business opportunities and support the delivery of creative solutions to client challenges. Previously, he held senior leadership positions at Cardno Limited, as Executive Vice President of Strategy Development; and at Entrix, Inc., as Chief Executive Officer.

MEMORIALS

Michael G. Shaw (ME85)

1990s

Baron Fidler (MinE93) completed twenty-one years with Dyno Nobel working with the field technical support team across North America. His new role with Cate Drilling Solutions is Mining Sales Manager. He supports mines in Idaho, Utah, and Nevada. Jana, Conrad (three years old) and he live in Draper, Utah.

Craig Nelson (MinE97) joined McMillen Jacobs Associates as the Director of Mining in the Boise office. He will manage four mining/construction projects in several states with yearly revenue of \$60 million and more than 200 employees.

MEMORIALS

Kenneth C. Holsten (MetE98)

Nancy L. Howe (ChE93)

2000s

Karen (IS06) and **Curtis Anderson** (IE08) are proud to announce their first child, Molly Kate, arrived on February 12, 2015.

Becky (Scholten) Reinhardt (ME05) and husband, Scott, welcomed a baby boy, Davis, in January 2015. He joins big sister, Delilah.

MEMORIALS

Jeremy C. Leander (CE02)



Corey Coggins (EE10) as Patsy and Joel Lankutis (EE10) as leader of the Knights Who Say "Ni"

Joel Lankutis (EE10) and **Corey Coggins** (EE10) both live and work in Billings, Montana, as Substation Design Engineers for the consulting firm POWER Engineers. The duo competed in the Cardboard Classic Sled Race during the 2015 Winter Carnival in Red Lodge, Montana. This year's theme was Camelot. For Joel and Corey this meant there was really only one logical option for their team's costumes, and that was the classic comedy *Monty Python and the Holy Grail*. Joel portrayed the leader of The Knights Who Say "Ni." His costume required that he appear to be over seven feet tall. Corey dressed the part of "Patsy," King Arthur's trusty assistant. The team of four was completed by their co-workers dressing the part of King Arthur and "Tim" the sorcerer. They took second place in the sled race—narrowly losing to four other co-workers. But their time spent on their costumes was rewarded when they took first place in the costume contest. Friend and fellow alum **Kyle Hansen** (CE10) was also in attendance.

Haley Galvin (IS03) and Cameron Carter, both of Dakota Dunes were married July 12, 2014. The ceremonies were held at the America Creek Fishing Pier in Chamberlain, South Dakota. The groom graduated from West Point Military Academy as a second lieutenant in May 2014.

Janile Lewis (EnvE09, MS CE14) and **Sean Bestgen** (EE13) were married in August in Rapid City. They are expecting their first baby in June 2015. Sean works for Caterpillar, and Janile completed her master's in May. They moved to Arizona after the New Year.

2010s



Vivien Marie

Robyn (CSc10) and **Eric Brandner** (CE08) welcomed their first child, Vivien Marie, on May 18, 2015.

Faculty & Staff

MEMORIALS

Dr. William N. Laval,
Professor of Geology



Josh and Whitney Green's Wedding Reunion

Josh Green (ME11) married Whitney Whitten in New Braunfels, Texas, on April 11, 2015, and during the reception an alumni reunion ensued. (Pictured, l to r) **Josh Green** (ME11), **Brogan Pappel** (ME14), **Crystal Croston** (MinE13), Whitney Witten-Green, **Adam Schulz** (CEng09), **Brad Johnson** (EE92), **Jim Green** (ME74), **Mike Hafner** (ME74), and **Rod Pappel** (ME77).



Jacqueline Aucker (CE12) with incoming freshman Colton Ryan

Jacqueline Aucker (CE12), assistant city engineer for the City of Minot, was one of more than fifty alumni who presented freshman scholarships this spring at high school events to approximately seventy incoming freshmen. Pictured with Jacqueline is incoming freshman Colton Ryan from Berthold H.S. in Berthold, North Dakota. Jacqueline commented that Colton, his family, and the school were extremely impressed that SD Mines sent someone to personally honor him. Sincere thanks go to all the alumni volunteers for helping welcome these incoming freshmen scholars.



Reunion alumni and guests gather on the Grand Terrace at Mount Rushmore, Sunday, July 12.

1. 20th Annual Alumni Tailgate Party – Pierre, South Dakota
Alumni Group Photo



2. 20th Annual Alumni Tailgate Party – Pierre, South Dakota
Program and Cooking Contests



AREA MEETINGS

3. Alumni Board Social – Rapid City, South Dakota: (l to r) **Carmen Adams** (ChE75), **Kathy** (Chem74) and **Ken Miller** (CE75), **Scott** (EE75) and **Linda Rausch** (ChE75)



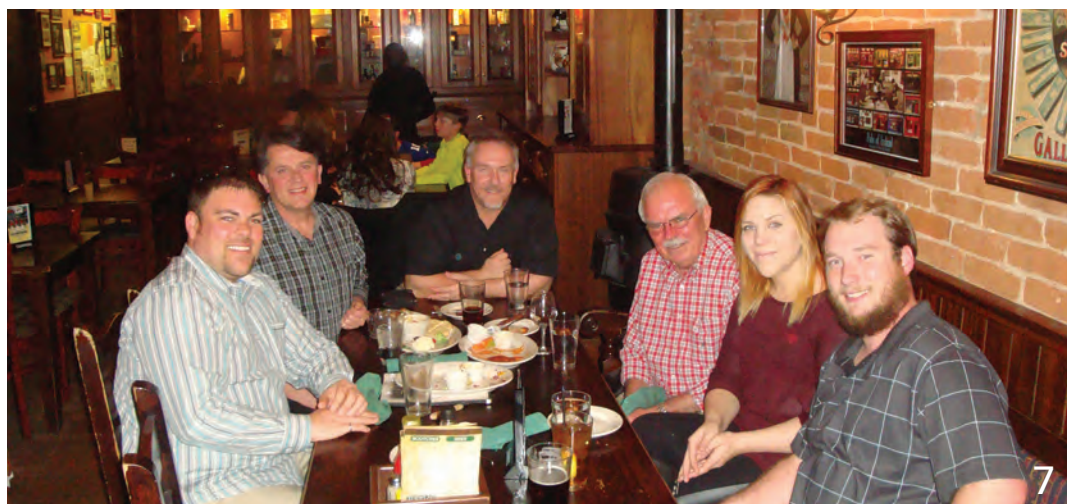
4. Alumni Board Meeting – Rapid City, South Dakota: (l to r) Past Presidents **Paul Gnirk** (MinE59), **Jerry Brown** (CE65), **Ken May** (CE61), **Bob Miesen** (CE61)



6. Casper, Wyoming: (seated, l to r) Deb Kullerd, Kathy Dolan, Bev Miller, Becca Maxwell, Sheila Pesek; (standing, l to r): Alumni President **Mike Alley** (GeolE73), **Brain Ames** (ME08), **John Dolan** (GeolE72), **Errol Miller** (CE59), **Andrew Maxwell** (EE07), **John Hoard** (Phys74), **Joe Corbett** (GeolE82), **Tim Vottero** (Chem84)



7. Colorado Springs, Colorado: (l to r) **Cameron Donegan** (ME06), **Ivan Mehlhaff** (ChE74), **Tim Vottero** (Chem84), **Dick Logue** (CE66), Samantha Tracy, Kyle Ward





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8. Denver, Colorado: (l to r) **Mary Jane Green** (CE78), Lucille Reilly and **Charles Snyder** (ME63), **Larry Simonson** (EE69), **Marty Amble** (CE68), Athletic Director Joel Lucken, **Kevin Hegerle** (MetE74), Merlyn and Liz Larson



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9. SME – Denver, Colorado: Alumni President **Mike Alley** (GeolE73) standing in the back row, center surrounded by SD Mines students



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10. SME – Denver, Colorado: **Jay Nopola** (GeolE01), Amy DiRienzo, **Leo Van Sambeek** (MinE72) staffing the RESPEC booth at SME



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11. Louisville, Kentucky: (l to r) – Alumni President **Mike Alley** (GeolE73) and Deb Kullerd, Mary and **Ted Iverson** (ME73)



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12. Mitchell, South Dakota: (front row, l to r) **Danielle Erdmann** (Geol05), **Toby Hullinger** (CSc12), Connor Carey (ME intern), **Steve Rice** (ChE82), **Bryan Brickman** (ME85), and **Bernie Schmucker** (CE49); (back row, l to r): **Kevin Erdmann** (ME04), **Keith Beck** (EE90), **Mike Henrickson** (CSc04), **Rune Torgersen** (CEng98), **Brad Osterloo** (CSc92), and **Jerry Weber** (IE00)

AREA MEETINGS

13. Hardrocker Weekend – Rapid City, South Dakota: (l to r) Four Hardrocker Horsemen **Rick Wass** (IS96), **Bruce Franzen** (MinE82), **Al Baue** (MinE82), **Dave Litzen** (ChE81)



14. Hardrocker Weekend – Rapid City, South Dakota: (l to r) Hardrocker Coaches **Ketty Paula**, **Ryan Larson**, **Tiffany McCampbell**, **Sherry Grismer**



15. 7th Annual Mines Masters – Chandler, Arizona: (l to r) **Dan Carlson** (ChE77), **Mike Selzer** (EE74), **Steve Newlin** (CE75), **Toby Day**



16. 7th Annual Mines Masters – Chandler, Arizona: (l to r) **Ralph Wagner** (CE75), **Mark Lux** (MinE80), **Dave Thomas** (ChE73), **Stacy Collins** (Head Football Coach)



17. Houston, Texas Group Photo



18. Class of 1965 Reunion – Rapid City, South Dakota: (l to r) **Ken Berg** (EE65), **Paul Gnirk** (MinE59), **Dave Berg** (ME73)



19. Class of 1965 Reunion – Rapid City, South Dakota: (l to r) **Brad Johnson** (EE92) with in-laws **Virginia** and **Bruce Conlee** (EE65)





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20. Class of 1965 Reunion – Rapid City, South Dakota: Faith Natives **Ed Heinrich** (CE66) and **Mike Alley** (GeolE73)

21. Class of 1965 Reunion – Rapid City, South Dakota: Class Photo with Grubby



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22. Zero Year Reunion – Rapid City, South Dakota: Amanda and **Ian Steckelberg** (ME15)

23. Zero Year Reunion – Rapid City, South Dakota: Senior “Hats” with **Wayne Baumberger** (ME96), third from right in back row



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24. Minneapolis, Minnesota: (l to r) **Charlie Murray** (IE03), **Mike Alley** (GeolE73), **Kevin McGinnis** (ME04), Deb Kullerd, **Matt Goeden** (CEng03), **Scott Fritz** (IE04)

25. Omaha, Nebraska: (l to r) Anne Ekern (Foundation), **Lynn Bell** (MinE80) **Lance Roberts** (CE98), **Brad Johnson** (EE92), **Tony Ritter** (MinE82), Heather Wilson (SD Mines President), Molly Moore (Admissions) at Kiewit



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AREA MEETINGS

26. Sioux Falls, South Dakota:
SD Mines President Heather
Wilson addressing alumni, current
students, potential students, and
others at Raven Industries



27. Sedona, Arizona: (l to r)
Carmen Adams (ChE75) and
John Adams, Dolores and **Roger
Kiel** (GenE58), Connie and **Hal
Nelson** (GenE58)



28. Arlington, Virginia: (l to r)
Alumni President **Mike Alley**
(GeolE73), **Ted Gull** (Hon99),
Bill Tucker (GeolE56)



29. Arlington, Virginia:
Washington Golf and Country
Club Group Photo



30. Sioux Falls, South Dakota:
Alumni and friends at the Canaries
vs. Winnipeg Wingnuts baseball
game



VETERAN RESOURCES

the proof is in the numbers

1,057%

Percentage increase in Veterans Resource Center usage from fall 2009 to fall 2014

154

Number of military and veteran students in fall 2014

#6

Current ranking in *Military Times* magazine's top 100 "Best for Vets: Colleges" survey

100%

Placement rate for military and veteran students for the past three years

5

Number of consecutive years the School of Mines has been ranked in the top ten colleges in the nation for military student support

2009

The year the Veterans Resource Center was established. Seven students regularly utilized the center in its inaugural year.

SOUTH DAKOTA



SCHOOL OF MINES
& TECHNOLOGY

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

