

THE HARD ROCK™

SUMMER/FALL 2018

SOUTH DAKOTA



SCHOOL OF MINES
& TECHNOLOGY

**THE
HARDROCK™**

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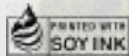
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(More on page 16)

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HARDROCK™**



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Greetings fellow Hardrockers and Friends,

It is an exciting day to be a Hardrocker! Thanks to a generous gift from Linda and **Larry (ME 72) Pearson**, the new [Pearson Alumni and Conference Center](#) is becoming a reality. I'm so excited that our alumni will now have a building on campus to call home. This is a facility where we can gather and carry on the many traditions of our great university and help connect students and alumni to the community.

It's been a very busy year for our Alumni Association staff and volunteers. We have just launched our new alumni website ([alumni.sdsmt.edu](#)) where you can connect with fellow Hardrockers and keep up with the latest happenings on campus and across the country. We also have our South Dakota School of Mines app, which can be downloaded for free from the App Store or Google Play.

Thank you again for allowing me to be president of your Alumni Association. It's been a great year filled with events and positive changes on campus. One of the most rewarding things for me is when I see the connection between alumni and current students. These connections often lead to educational and networking advice, which eventually leads to a career. That is a huge benefit of going to a smaller engineering college where most of our alumni can help connect students with future career opportunities. Please contact the alumni office and get involved with your local alumni chapter to help make these connections happen.

Alumni often ask how they can assist in making Mines successful; the greatest help is promoting the campus to potential students. Our alumni are one of the biggest recruitment tools for the university. Encouraging potential students to check out the school and the degrees offered provides a tremendous benefit.

Don't forget to make plans to attend the next five-year reunion July 8-12, 2020. The reunion is a fun event where you can hear many stories being told about our campus traditions and spend the week laughing about your time spent on campus. I'm looking forward to seeing many friends there as well as making a few new ones.

Gregory "Vetter" Hintgen (EE 99)
2018 President
South Dakota School of Mines & Technology Alumni Association



Photos courtesy of
Devereaux Library, SD Mines

130 years ago
1888

Construction of the Metallurgy Building is completed. The two-story brick structure costs \$10,000 to build. The facility includes laboratories, classrooms, and office spaces for the metallurgy and mining departments plus a steam engine, smelter, ore roaster, stamp mill, and concentrating tables.

90 years ago
1928

WCAT, the "Wildcat of the Hills" moves to its new studio in the Prep Building. The station led the way for KTEQ-FM which is still broadcasting from the Mines campus today.

50 years ago
1968

President Harvey Fraser begins the tradition of honoring alumni who graduated 50 years ago. The 1968 commencement included alumni who graduated in 1918 or earlier.

The photo above is the 1918 Mines basketball team.

15 years ago
2003

Spirit Rock, located between the Classroom Building and the Grubby statue, was dedicated on April 26, 2003. Since then multiple layers of spray paint have been added with messaging promoting student events.



Dear Hardrocker Friends,

As a graduate, you understand the beauty the Black Hills and Badlands have to offer. Wendy and I have enjoyed the move back to this part of the country, not only for the gorgeous landscapes of western South Dakota, but also for the bright future that is unfolding around SD Mines.

Our university has a long history of turning out top-tier engineers, scientists, and innovators. Many have gone on to form successful companies such as RPM & Associates and RESPEC. Today we are building more opportunities for our graduates to stay in this area and thrive, or to move back here and raise a family. Ascent Innovation, formerly the Black Hills Business Development Center, is building a new space downtown where Mines students and alumni can test new ideas and start new companies. The current business incubator has a wide range of success stories, and the future holds even greater potential.

In this issue of the *Hardrock*, we profile some of the exciting innovative local companies and ideas in “The Rising Tide.” There are also examples of Mines alumni who are making an impact here and around the world: **Richard Wold (ChE 76)** served as a forensic chemist for the Rapid City Police Department for almost two decades, **Jim Skorpik (EE 68)** designed an acoustic gunshot detector that can save lives in schools and public buildings, **Scyller Borglum (PhD GeolE 18)** has proven an excellent role model for students who want to pursue careers in STEM fields while finishing her own doctorate at Mines. There are so many examples of successful Mines alumni that it’s impossible to profile them all.

Our graduates will always be in high demand. This past fall saw the largest career fair on campus with 150 companies on hand, including many of the biggest names in industry. The effort to grow innovation and entrepreneurship runs parallel to the ongoing effort to turn out the best and brightest engineers and scientists.

There is an exciting future at SD Mines!

Warm Regards,

Jim Rankin, PhD

President

South Dakota School of Mines & Technology

Ask the Mines Expert

Wyatt Engel (CSc 18)
Hardrockers Athletics Esports Coordinator



What is Esports?

In 2015, video games surpassed film and music in the entertainment industry market share. This multibillion dollar industry has attracted the hearts and eyes of players around the world. In the video game space, a subculture

has developed with a competitive twist, which we call Esports.

Esports, or electronic sports, is computer-facilitated competition, more simply put, it's organized video gaming. Esports began as a niche group of passionate spectators. Today, enthusiasts fill up the biggest stadiums in the world for events like the League of Legends World Championship and Dota 2's "The International."

The viewership for major Esports tournaments rival many traditional sports. This past fall, the League of Legends World Championship boasted 57 million unique viewers for the tournament final. Top professional players sign million-dollar contracts and compete for prize pools up to \$24 million. With the huge Esports boom over the past couple years, many familiar investors have flocked to the industry. In the past year, the Houston Rockets and the Golden State Warriors have both acquired their own professional League of Legends teams.

Professional teams have intense practice regiments and support from coaches, physical trainers, nutritionists and sports psychiatrists. A player's dedication and passion is on full display for every spectator to see. Just like most competitions, there is adrenaline, glory and even heartbreak. Esports is redefining what it means to be an athlete in the 21st century.

Come home HARDROCKERS

Five-Year Reunion

Wednesday, July 8 to Sunday, July 12, 2020

When Jim Skorpik's grandchildren went through an active shooter lockdown at their elementary school, his work developing a gunshot detector got very real for him.

"It was pretty traumatic for my grandkids," says **Skorpik (EE 68)**. During the lockdown, his grandson hid under mats in the gymnasium and teachers wept. The incident was a false alarm, but the experience made Skorpik's work even more meaningful. "They were pretty shook up, and so was I," he says.

Skorpik, a Pickstown, South Dakota, native, earned both his undergrad and graduate degrees from SD Mines before joining the work force, first in 1970, in the United States Army at Fort Bliss in El Paso, Texas, and in 1972, with Pacific Northwest National Laboratory (PNNL), a U.S. Department of Energy lab located in Richland, Washington.

As chief engineer with PNNL, he has 14 patents and has won four *R&D Magazine* awards. The Acoustic Gunshot Detection Technology, one of his final projects before retirement earlier this year, has proven to be an especially timely and successful one.

The device, which alerts law enforcement to the sound and location of gun fire, was recognized by *R&D Magazine* as one of the top innovative scientific breakthroughs in 2017. It has been featured on National Public Radio and in multiple other media.

Skorpik and his team began developing the acoustic gunshot detection device in 2012, after the school shooting at Sandy Hook Elementary where 20 first-graders and six adults were shot and killed.

Active-shooter detection systems already existed in 2012, but most were large, expensive and designed for outdoor locations. "We wanted to come up with something very cheap and small," he says.

So they did.

While large existing detectors required expensive wiring, the Acoustic Gunshot

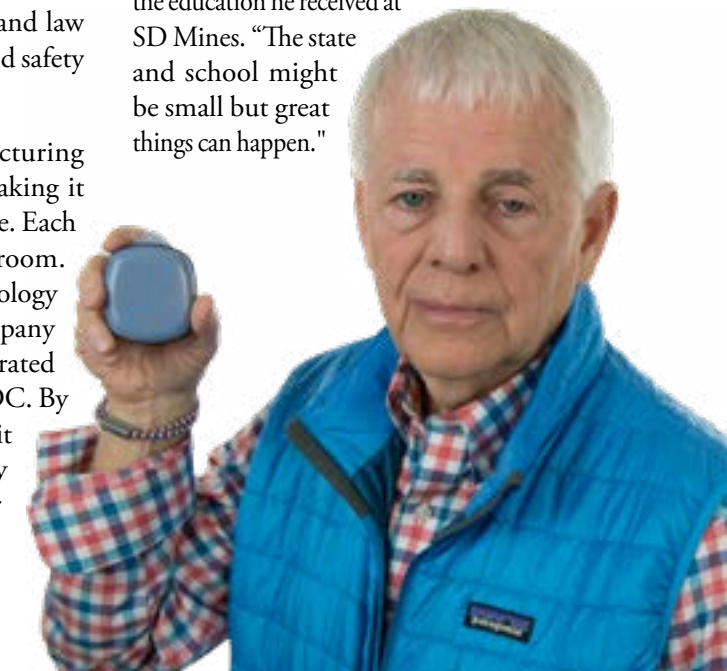
Detection Technology is about the size of a golf ball and is battery powered, connecting wirelessly to existing security systems. With a high degree of accuracy and within about two seconds, the sensor can distinguish between a gunshot and the sound of such things as a locker slamming or books being dropped. Once the device detects gunshots, it uses its onboard wireless link to immediately activate the school's security system. It identifies the location of the gun shots, the weapon and the number of bullets fired. It can text students, staff and law enforcement with critical exit and safety information.

The estimated cost of manufacturing the device is less than \$100, making it manageable for schools to acquire. Each detector covers an individual room. PNNL licensed the device technology to Security USA Services, a company in New Mexico, and Eagle Integrated Services based in Washington, DC. By licensing it to both companies, it can be mass produced. Security USA has incorporated the sensor

into its Emergency Automatic Gunshot Lockdown or EAGL Systems.

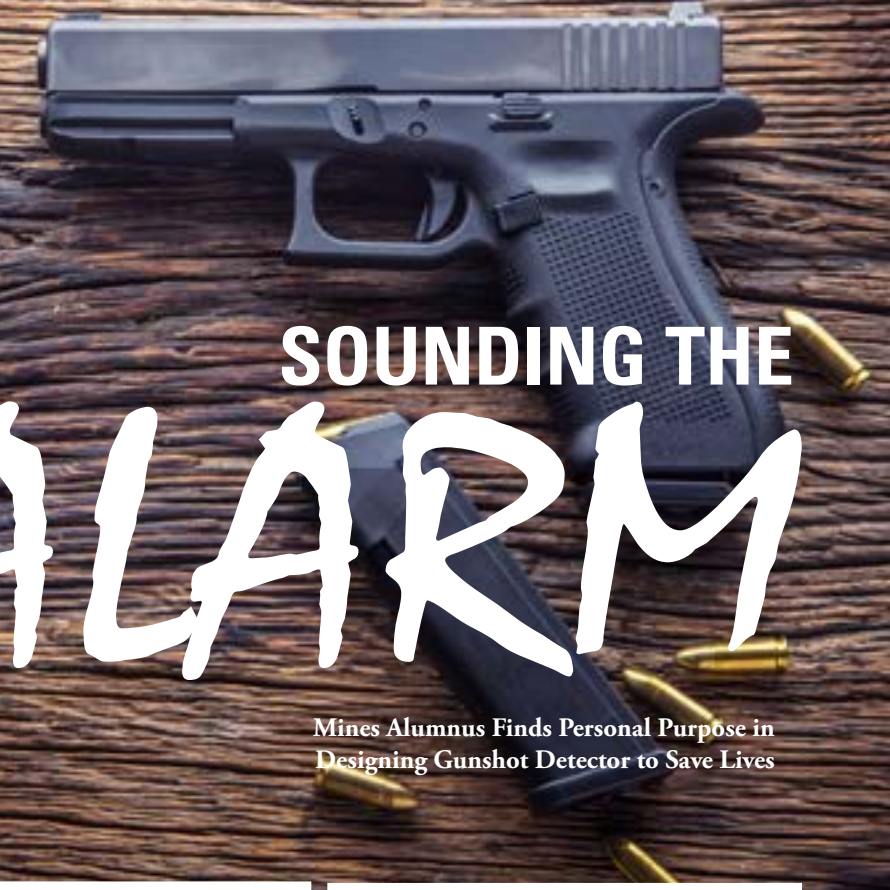
Skorpik is grateful to have been part of a project with so much meaning, both personally and professionally. He hopes that the device will save lives by providing critical information to those who need it in an emergency.

And he's proud to tell people that his professional successes, including the gunshot detector, were possible due to the education he received at SD Mines. "The state and school might be small but great things can happen."



SOUNDING THE ALARM

Mines Alumnus Finds Personal Purpose in
Designing Gunshot Detector to Save Lives



THE DRUG DETECTIVE

**SD Mines Alumnus Retires as
Lead Forensic Chemist**

In 17 years as lead forensic chemist in the Rapid City Police Department's evidence lab, Richard Wold can't recall a day he didn't enjoy going to work.

Wold (ChE 76) officially retired from his beloved job in June, but on a Friday afternoon in May, he was still knee deep in the work of drug analysis, identifying controlled substances seized by law enforcement and serving as an expert witness in court.

**"I have the best job in
the whole building,"**

he said, swinging his arms wide. "I mean, we get to play with drugs and get paid for it."

Giving a tour of the lab, Wold ticked through the names of countless chemical compounds, demonstrated the drug analysis equipment and explained in detail how it identifies individual drugs down to the millionth of a gram. On a nearby table, a meth pipe inside a plastic bag awaited testing. At another table, Trenton Pruden, Wold's fellow forensic chemist, prepared a test tube solution for testing.

Wold pointed to a computer screen, where a program analyzed the latest evidence sample. He admits that sometimes, when a test result works out just right, he might do a little "happy dance." "This is too much fun," he said with a giant smile.

Wold joined the city's drug analysis lab in 2001, working under the tutelage of the late Jack Gaines, PhD, a long-time SD Mines chemistry professor. Gaines began doing drug analysis for the police department in 1970, while still a Mines faculty member. He retired from teaching in 1996, to work full-time in the lab.

Wold apprenticed under Gaines for two years, taking over as primary analyst in 2003. In addition to his work in the lab, from 1988 to 2000, Wold also taught freshman chemistry on the SD Mines campus. Many

classroom experiments followed his lectures, and "anything that would burn or blow up, we did it," he says. "Anything to get them interested."

Over the years, Wold has hosted countless work-study students and interns from SD Mines, keeping his connection with the school strong. Brooke Remily, a senior chemistry major from Black Hawk, South

Dakota, interned with Wold a year ago. When she started her internship, she wasn't sure which way she wanted to go in her career. Wold changed that.

I wasn't able to work directly with their samples. I learned more than I could have imagined just by being there and talking with him."

As lead forensic chemist, Wold has had a front-row seat to the changes in drug arrest trends and the skyrocketing need for drug analysis. When he first joined the lab in the early 2000s, marijuana was the drug of choice. Today, methamphetamine has taken a grisly toll on the community, with meth arrests up drastically. In 2010, the lab did 1,219 tests with 223 testing positive for meth. In 2017, the lab did 2,714 with 1,137 testing positive for meth. Wold has personally done 28,179 analyses since 2003.

Before Pruden joined the lab a year ago, Wold was the sole analyst in the department. As the methamphetamine epidemic grew in severity, Wold found himself coming to the office by 6 a.m. six days a week, struggling to keep up. "It's a killer," he says of meth. "Looking at the meth abuse ... it's so discouraging."

Despite the discouraging increase in meth drug arrests, Wold has never wavered in his passion and love for his work. Not only does he find the science fun, he understands the value. "What we are doing has great social impact," he says.

Now that he's hung up his lab coat for retirement, Wold has a few plans that don't involve chemistry. He wants to sleep past 4 a.m., have more time to play with his three grandkids and spend more time woodworking, or as he calls it "wood butchering."

He's grateful to have had a career he loved so much and proud that it started at SD Mines. "This was just too much fun," he said. "I'm very lucky."



Onward & Upward

SD Mines students are some of the best and brightest in the country. Unfortunately, we can't profile every single one. Instead, we'd like to introduce Hardrock readers to four students who exemplify the talent, commitment and determination of our many students.

During his four years at SD Mines, **Dalton Lyons (CE 18)** didn't watch Netflix or play around on social media. He didn't have time.

Lyons, who graduated with a degree in civil engineering in May, served as an officer on the Concrete Canoe Team, an officer in the American Society of Civil Engineers, president



»»»
DALTON
LYONS

of Chi Epsilon, a member of Tau Beta Pi, president and vice president of the Professional Development Institute for Student Leaders and a student member of the community development organization East of 5th. He was also named to the 2018 Leadership Hall of Fame.

Before becoming a Hardrocker, the Sundance, Wyoming, native spent five years in the United States Navy. He thinks some of his leadership abilities were honed during his time as a Seabee, but says his commanding officers suggested that the leadership ability was more innate. He hopes to continue developing and growing his leadership traits in his professional life, with plans to eventually become a real estate developer. He began his career in June with Hensel Phelps in Honolulu, Hawaii, where he hopes to learn and grow as both an engineer and a leader. From there, the sky's the limit.

When single mother **Rachel Caesar (CE 18)** walked across the stage in May to accept her bachelor's degree in civil engineering, she had three especially important guests in the audience.

Caesar's three children, 8-year-old Levi, 11-year-old Abbey and 14-year-old Isaac, were the reason she decided to go to



»»»
RACHEL
CAESAR

college at the age of 29. Caesar grew up in Huron, South Dakota, and spent summers in Rapid City. While still in high school, a career placement test listed engineering as a possible career for her. Instead of college, however, Caesar married and started a family. Years later, as she considered college, she remembered that placement test.

After starting slowly, taking a semester here and there, Caesar eventually entered school full-time. As a single parent, Caesar says she couldn't have done it without the help of her boyfriend, who did things like cook meals for the kids so she could study. In addition to her academic work, Caesar was also active in various campus clubs and city committees, including the Rapid City Planning Commission and the Rapid City TIF District Review Committee.

A week and a half after graduation, Caesar stood on a dusty country road supervising a pipe project as a transportation engineer with HDR in Rapid City, a world-wide engineering and architecture company. "The hard work paid off," she said with a smile.

At age 17, **Bo Paulsen (ME 18)** had skipped so many of his high school classes that instead of spending another year catching up, he decided to drop out. Paulsen eventually earned his GED, getting a perfect score in science and one of the highest overall GED scores the testing location had ever seen. Still, instead of going to college, he decided to enter the workforce.



»»»
BO
PAULSEN

After working retail and restaurant jobs, Paulsen realized he couldn't have the things in life he wanted – a house, the ability to travel, hobbies – without a college degree.

By that time Paulsen, an enrolled member of the Rosebud Sioux Tribe, was already in his late 20s. He assumed he had missed his opportunity until a professor at Oglala Lakota College (OLC) in Rapid City assured him it wasn't too late. So, seven years after dropping out of high school, Paulsen began taking classes at OLC, and eventually transferred to Mines. In May, he graduated with a degree in mechanical engineering and began his new job at Barrick Gold in Nevada. At Mines, Paulsen was involved in the American Indian Science and Engineering Society (AISES), was a Tiospaye Scholar, a member of the Center of Excellence for Advanced Manufacturing and Production (CAMP) and the Aero Design team. He also took first place in the annual Undergraduate Research Symposium held by the South Dakota Experimental Program to Stimulate Competitive Research.

Whether **Joree Sandin (ME 18)** chooses a career working on rockets or developing prosthetics, she's certain of one thing. "I just want to help people," she says. "That's what I want to do with my career at the end of the day."

Sandin graduated from SD Mines in May 2018, with a degree in mechanical engineering. She plans to attend the



»»»
JOREE
SANDIN

University of Kentucky in Lexington to pursue a master's and PhD in mechanical engineering.

Growing up in Greeley, Colorado, Sandin always dreamt of a career in space exploration. "I love space," she says. "Stargazing is one of my favorite things to do."

Her passion for space led to her involvement with multiple space-related clubs and events on and off campus, including serving as president and team lead of the Moonrockers robotics team. The Moonrockers design and build robots to compete in the annual NASA's Robotic Mining Competition each summer. The team took home a 7th place finish in 2018. Sandin competed in the competition four times as a Hardrocker.

She has also been part of the Professional Development Institute, Students for the Exploration and Development of Space, Women in Science and Engineering, Society of Women Engineers, and was named to the 2018 Leadership Hall of Fame.



Building a Culture of Black Hills Tech Innovation and Entrepreneurship

THE RISING TIDE

Innovation rarely happens in a vacuum. Earth-shattering breakthroughs and the inspiration needed to carry them out come not only in laboratories and offices but also during free-flowing conversations in brew pubs, on mountain bike trails, and in quiet coffee house dialogue with close friends.

We are social animals, and innovation and entrepreneurship flourish when spurred by healthy competition and nurtured by a supportive culture and attitude.

SD Mines is at the epicenter of the emerging Black Hills tech sector; we're building community partnerships, supporting exciting

infrastructure improvements, and fostering the spirit and mindset needed to create the positive momentum to lift the regional economy and build jobs across the board.

Here are some examples of new and existing businesses and research that showcase the potential and herald an exciting future.

GIANT VISION

The annual Governor's Giant Vision Competition helps provide start-up funding assistance for South Dakota residents with viable business ideas through an entrepreneurial competition. SD Mines has won the student

division of the competition the last four years. The 2018 winner, Plateau Energy Films, is the brainchild of Mines student Bill Trevillyan, a double major in chemical engineering and chemistry. Plateau Energy Films proposes to produce and sell transparent energy saving window films that Trevillyan helped develop during an internship at Argonne National Laboratory. The film is impregnated with vanadium dioxide nanoparticles that block infrared heat during the warm summer months and let it through during the colder winter months. Trevillyan estimates that a typical commercial building with an annual heating and cooling bill around \$180,000 will save approximately \$20,000 per year.

Trevillyan also started the "Innovation Club for Entrepreneurs" on campus to support students who are interested in turning their ideas into businesses. The club funnels students towards programs such as [Engineers Make Great Entrepreneurs](#), the Business Plan Competition, Start-Up Weekend events and the Governor's Giant Vision Competition. "There are a number of great things happening at Mines," says Trevillyan. He adds that there are potential opportunities with a continued emphasis on research at Mines. He also touts the added capacity coming with the expanded incubator in downtown Rapid City and the launch of Ascent Innovation.

INTOUCH LLC

One fledgling company with great promise is the student-run start-up InTouch LLC. The custom software company founded by students **Savoy Schuler (CSc 18)**, **Jared Johnson (CSc 18)**, **Brady Shimp (CSc 18)**, **Daniel Hodgkin (CSc 18)** and Jeffrey McGough, Ph.D., professor of math and computer science, is now run by president and CEO Samuel Whitehead, a senior in computer engineering. This company builds websites and utilizes virtual and augmented reality to help local businesses market their products. It can also be used as an education

tool. Imagine a second-grade classroom where 3-D hologram-like images of the solar system can be projected overhead and students, equipped with augmented reality headsets, can reach out and move the planets, moons and asteroids around the room. The company also helps local businesses, such as Black Hills Ammunition, market their products through virtual reality. InTouch LLC has eleven employees, all SD Mines students, who serve clients in the Black Hills area and around the country.

"It is encouraging to see the Black Hills area starting to spur growth in tech industries. Our team is proud to be a part of the

development of the community and excited to see what is in store. The added support from the school and student body at SD Mines has been wonderful,” says Whitehead.

INNOVATIVE SYSTEMS

Human capital has always been Mines’ most valuable asset. To excel in any science and engineering school, students must have a solid work ethic and a strong foundation in STEM. Innovative Systems is one example of a company leveraging Mines talent to remain competitive. The company specializes in developing software for the telecommunications industry and has an office in the Ascent Innovation center on campus. Innovative Systems employs Mines students during their college career in hopes of keeping many of them on board after they graduate.

“Innovative Systems is looking for students who have a reasonable chance of working in South Dakota,” says **Dave Springhetti (ME 73)**. “About half to three-quarters of our interns get company job offers.”

It’s a win-win for both students and the company. Students have good paying jobs while in college and a leg-up into their desired industry. “College students normally work at a coffee shop,” says Hannah Wegehaupt, a computer science senior at Mines and Innovative Systems intern. “We chose computer science because that’s our passion, so we get to do our passion and get paid for it while in school which is really nice.” Wegehaupt adds that the experience at Innovative Systems is also a boost to her education. “We’ve been given the opportunity to build and design a multi-year project while in college.” Interns get to follow the entire process designing software from idea to marketplace. Along the way they are acquiring valuable skill sets that will help in their future career. “We get to do so in a very safe environment where our livelihoods are not on the line,” adds Benjamin Garcia, a senior computer science major and company intern.

This model also allows Innovative Systems to build a talent pipeline from Mines right to their front door. In the long run, this effort helps keep talented young people in South Dakota.

VRC METAL SYSTEMS

Cold spray technology was perfected in the AMP Lab at SD Mines in collaboration with the Army Research Lab. The process uses an electrically heated high-pressure carrier gas, like nitrogen or helium, to accelerate metal powders through a supersonic nozzle above critical velocity for particle adhesion. The bonding mechanism is a combination of mechanical interlocking and metallurgical bonding from re-crystallization at highly strained particle interfaces. In layman’s terms, the technology can be summarized as “spray on metal.”

SD Mines associate professor Christian Widener, PhD, recognized the commercial potential of cold spray technology and joined company CEO Robert Hrabec to co-found VRC Metal Systems. The company designs and manufactures cold spray equipment and advanced manufacturing systems.

VRC is a shining example of how investment in research can translate into new technologies and high-tech jobs in the Black Hills. VRC started in Ascent Innovation located on campus and is now in the process of relocating its headquarters to the former Vandenberg Elementary School building in Box Elder. The United States Air Force is among VRC’s top clients. Cold spray technology allows cost-effective repair of irreplaceable parts on weapons systems like the B-1 Bomber, saving the Department of Defense millions in maintenance costs each year.

In April 2018, Governor Dennis Daugaard recognized Widener as South Dakota Entrepreneur of the Year. “A nationally recognized expert in cold spray technology, Dr. Widener has more than 60 publications and multiple patents because of his research and development work in advanced materials

processing technologies,” said Daugaard. “VRC’s successful strategy sets the precedent for all Giant Vision competitors, making Dr. Widener an ideal choice for Entrepreneur of the Year.”

SURF, DUNE AND BEYOND

SD Mines and the Sanford Underground Research Facility (SURF) share a long and productive history. The relationship between the university and the former Homestake Mine predates South Dakota’s statehood. Mines also played a role in the Nobel Prize-winning Davis Experiment by supplying some personnel and support for the project during the years prior to the shutdown of the Homestake Mine.

Mines officials were part of the broad effort to establish the Sanford Lab and the university is deeply involved in many of the exciting experiments now operating underground. These include the MAJORANA Demonstrator, the Compact Accelerator System for Performing Astrophysical Research (CASPAR), the Enhanced Geothermal Systems Collaboration (EGS Collab), the dark matter experiments LUX and LZ, and the Deep Underground Neutrino Experiment (DUNE) which will be the largest project at SURF. Being built over the next ten years, DUNE, will employ university personnel during construction and operation phases. At its peak, construction of the project is expected to create almost 2,000 jobs throughout South Dakota. DUNE will attract students and young scientists from around the world, helping to foster the next generation of leaders in the field and to maintain the highly skilled scientific workforce in the United States and worldwide.



A Simulator for Success

*SD Mines Golf Team Members
Build Simulator to Up Their Game*

If you are into skiing, snowmobiling, or pond hockey, winter in South Dakota might be your favorite season. But if golf is your game, not so much. The cold South Dakota winters are not conducive to the long hours of golf practice needed to maintain a competitive advantage in the Rocky Mountain Athletic Conference.

But engineers love challenges, and **Korey Pryer (ME 17)**, **Brooke Robinson (CEng 17)**, **Chris Kolegraff (CEng 17)**, and **Collin DeCora (ME 17)** are no exception. Following up on an idea sparked during casual conversation while he was a student at Mines, Pryer brought together a senior design team that built a golf simulator in the Mines athletics department.

“Our main focus was to enable the golf players to practice during the long winter months,” says Robinson. This was the key intention for the simulator, as it was the entire concept in the students’ Golf Simulator Design Reference Manual. “The school is having trouble keeping up with the other teams in the conference, and the department feels that solving this need will greatly

improve the scores of the golf team.”

With varying backgrounds between computer engineering and mechanical engineering, the students were able to come up with a design that is valuable for both the men’s and women’s Hardrocker golf programs.

The students even calculated how much of a difference there was between SD Mines golf players versus golfers at CSU-Pueblo for reference. “When you compare the SD Mines scores to the CSU-Pueblo team scores, there is a variation of 17 strokes. This is 4.25 strokes per person. Part of this difference can be attributed to the warmer and drier climate of Pueblo ... this weather advantage is what we are trying to eliminate to help close the scoring gap,” Robinson says.

All four students also worked together to create from scratch a camera tracking system, one of the more attractive parts of the simulator. Their reference manual explains in more detail: “It was created for the purpose of tracking a golf club throughout a golfer’s swing. The high-quality

video allows the user to view their swing in slow motion. The tracking line will also indicate how fast the club is moving and changes from green to red to indicate the velocity of the club head.”

Not only is this a great tool for the existing players, but it is something that future golf recruits will definitely take an interest in. “There was a lot of concern for players during the winter time and now there is this tool to help with that,” explains Pryer.

Pryer clarified that he has never seen a golf simulator for a school at the NCAA Div. II level and says not only is it “really cool for a school this size,” but points out also how important it is for the golf program.

There is no doubt these recent graduates have left their mark on Hardrocker Athletics, and it is one to surely be proud of.



TAKES WINDING ROAD

TO ENGINEERING



Just three years ago, **Scyller Borglum (PhD GeolE 18)** stood in her boss's office in the oil fields of North Dakota and learned she no longer had a job. "It was devastating," she says. "I begged to keep my job. It was not my most dignified moment."

At that point in her life, Borglum had already given up a 401K retirement plan and a six-figure salary in sales at the age of 32 to re-tool her life. But if people learn nothing else from Borglum, it should be that she's not easily deterred. She sports an internal drive that's taken her from a Norwegian language minor to a PhD in geological engineering from SD Mines. Her path has been a lot of things—unusual, inspiring, and heartbreaking. But in May, when she became Scyller J. Borglum, PhD, she proved that nothing and nobody could stop her once she set her sights on the prize.

Her next journey could prove just as challenging—as a candidate for a seat in the South Dakota State Legislature in Rapid City's District 32. Borglum approaches this challenge like she does everything—with gusto. After collecting enough signatures to place her name on the ballot, Borglum sat down and wrote 100 personal thank you notes. "It is how I was raised. You thank the people who help you," she says.

A Montana native, Borglum gives at least partial credit for her determination to her mother, who became a stock broker in the '80s after 12 years as a stay-at-home mom. Borglum, a tween at the time, absorbed the lesson that she could do anything.

Perhaps her most significant experience in high school was her election as governor in the Youth Legislature and Government Program, which planted a political seed.

After high school, she attended Pacific Lutheran University in Tacoma, Washington, choosing an international business major with a Norwegian/Scandinavian language minor. A year-long Fulbright Scholarship in Oslo, Norway, followed.

While Borglum's high school experience in the Youth Legislature planted a seed for

politics, the year in Norway opened her eyes to energy when she studied sustainable development with a Norwegian business.

Returning to Montana, Borglum faced one of the greatest challenges of her life – the death of her younger and only brother, Troy, who was killed in a motorcycle accident.

Her brother's death left her deep in grief, and Borglum struggled to find her next step. "I was really reeling," she says. On impulse, she packed up her things, drove to Seattle and took a job as a legal secretary. While the job wasn't a good fit, "I was the world's worst legal secretary," it helped get her back on track.

“I knew
two things.
I wanted to
work in the
Bakken Oil Fields
and I wanted to
earn my
PhD.”

She spent the next two years in divinity school earning her first master's followed by four years as a pharmaceutical sales rep.

Despite the comfortable salary in sales, Borglum admits her interest in energy and sustainability never waned. So, at the age of 32 and with no previous engineering education, Borglum decided she was going to be a petroleum engineer. "I hadn't done math or science in 15 years," she laughs. In three semesters she completed enough post-baccalaureate pre-requisites to launch headfirst into a master's degree at Montana Tech in Butte. "Going forward, I knew two things. I wanted to work in the Bakken Oil Fields and I wanted to earn my PhD."

By mid-2014 Borglum was working full-time in the oil fields in Dickinson, North Dakota, and in January 2015, simultaneously started her PhD at SD Mines. Every other week, she drove back and forth for classes on the Mines campus. Despite the "brutal schedule," Borglum settled in for the long haul. Then, the oil boom busted, and Borglum arrived at work one spring day in 2015 to find her planned career cut decidedly short.

At that point, she had three degrees, school debt, no job and ongoing PhD studies at Mines. Borglum saw only one option—she packed up once again and headed to Mines.

Borglum quickly became a fixture on the Mines campus, serving first as a teaching assistant for undergraduate classes and then as the research assistant for the Energy Resource Initiative and teaching study habit classes to undergrads. She let nothing get in the way of her goal. When she found out she needed a bachelor's degree in engineering to sit for the Professional Engineer's License exam, she completed classes for her second bachelor's degree in petroleum engineering at Montana Tech while doing doctoral research at SD Mines.

With more on her plate in a year than most people will do in a lifetime, Borglum would be forgiven for taking a breather after May. Maybe take a vacation, read a book, watch a little Netflix. But that's not her style. "My dad has an incredible work ethic. Maybe when he is 75 I will be able to keep up with him." Instead, she is focused on her campaign for state legislature.

While her campaign keeps her busy, Borglum plans to continue her work in energy and power, and continue to serve as an advocate for women in science and engineering.

She is living proof that there's no age or gender limit to pursuing a dream. If a person is willing to put in the hard work.



Brandon Cruse Mines Alumnus and Big 12 Referee

CRUSE CONTROL

Everyone makes mistakes. Now imagine one of your mistakes played out in front of one hundred thousand jeering fans in a giant stadium. Imagine millions of ESPN viewers at home simultaneously screaming at the TV over your misstep.

This is the sort of challenge that **Brandon Cruse (IE 05)** thrives on.

“Officiating allows me 200 plays each game to see how good I can be at something that is very, very difficult,” he says.

Cruse is a referee for NCAA Division I college football. On any given Saturday during football season, you can find him on a faraway field wearing the striped uniform and white cap. “We try our damndest to get everything right,” says Cruse. “People think we don’t admit when we’re wrong, but if we make a mistake we’re happy to have the decision overturned,” he says. “We want to manage the game so the players can decide the outcome.”

It turns out that DI referees like Cruse go to great lengths to ensure the integrity of the game.

Continuous Improvement

Emotional intelligence and continuous improvement are buzzwords in industry these days. But Cruse notes, “improvement can only happen with a failure.”

To learn from mistakes, referees at the DI level undertake a scrupulous process. For Cruse, this starts on Monday morning at 5 a.m. with the video from the previous weekend game rolling on his tablet computer. “Every play is

reviewed to the finest level of detail.”

Cruse and his team spend hours discussing and breaking down each call that was made.

“The people who are most honest with their self-evaluation, by recognizing mistakes and by giving themselves credit for a job well-done, are those most likely to improve,” says Cruse.

Emotional intelligence is required during a game as well. “You’ve got to have a one-play mentality,” he says, “Whatever happened on the last play is done. Focus on the next play. Let it go and be brand new.”

Cruse says the skills he developed officiating are valuable in many

aspects of his life beyond the football field.

A Path from the Prairie

The story of how a SD Mines industrial engineering graduate ended up as a referee for the biggest college football games in the country has a humble beginning in the capital city of South Dakota.

Cruse loved his time in athletics at T.F. Riggs High School in Pierre. “I

thought about trying to play football at Mines,” he says. “But, I wanted to focus on studies.” Cruse had about half his tuition paid for by scholarships. “It is one of the main reasons I decided to come to Mines,” he says.

In his freshman year, Cruse started to miss the adrenalin and camaraderie of team sports. He called his dad, who suggested that if he couldn’t play he should consider refereeing. Cruse took that advice and started officiating high school football during his sophomore year at Mines. He quickly found the same camaraderie among referees that he knew as a player. He began officiating games on weekends while continuing to pursue his college degree. After working high school football, he met some referees who worked local college games. One of them was Stan Evans, a now retired Rapid City Area Schools principal. Evans needed a new football referee crew in the Rapid City area and Cruse made the list.

“The guys at the high school level taught me the passion for it. At the college level, I learned to hone my craft and manage games,” says Cruse. “High school games are great. But I had never seen intensity like my first Black Hills State vs. SD Mines game.”

Cruse manages the intensity of his job thanks to supportive employers and family at home. “My wife, my parents, and my in-laws have been amazingly supportive helping fill in the gaps left behind when I travel,” he says. These days he travels a lot, spending about 26 weekends per year away from home at games or training conferences.

The Engineering Advantage

The science and engineering curriculum at SD Mines fosters critical thinking and complex problem solving. These

are assets to any referee. “You’re making so many decisions. Sometimes ten decisions per play,” says Cruse. “Mines teaches you how to detect patterns and how to be an analytical thinker.”

Cruse recently completed seven years working for Regional Health as a management engineer and business growth program manager and now runs his own consulting business providing growth and management services to existing companies or new start-ups. He says the lessons he learned as a referee also translate back to his work in the office.

“It’s not just about football; it’s how to manage conflict,” he says. “What college doesn’t prepare you for is how to handle a room full of people who want to see a certain outcome. That is what’s happening on a football field. A coach wants to win a game, his job might be on the line, the jobs of his coaching staff might be on the line. It’s a high stress situation,” says Cruse. “In engineering meetings different stakeholders have different needs. There are a lot of parallels in managing a coach and managing stakeholders.”

The Next Play

His success on the field has potential to grow. He is a young referee and his experience in college football could help him qualify for a future job with the NFL. But this is not something Cruse dwells on. “That will take care of itself. If it happens, it happens,” he says. “But, right now—I have a game on Saturday,” he adds with a smile.

His career as a DI referee has taken him all over the country. He has worked stadiums on both coasts, plus Hawaii and the Bahamas. But he remains humble in his achievements, “I always say the biggest game is the next game. I’m always grateful to get the next game.”



Jim Kotas (EE 68) | Wayne Binfet (EE 68) | Dennis Krause (EE 68)
Jim Neuharth (ChE 68) | Craig Nordby (EE 68) | Don Orton (EE 68) Not pictured

Fifty years ago, the world was rocked by political turmoil following the assassinations of Martin Luther King, Jr. and Robert Kennedy. The Civil Rights Movement was in full swing and tensions in Vietnam were boiling. America watched in fascination as three astronauts circled the moon during the Apollo 8 mission.

These events formed the backdrop for the graduation of the SD Mines class of 1968. The seniors of '68 were a close-knit group of friends known for their willingness to join and organize events, projects, and class celebrations.

These baby-boomers left Mines with diplomas in hand to pursue careers and start families. They scattered across the globe, but they stayed connected with help from the Alumni Association and persistence from networks of friends. One of those groups of friends kept in touch through Christmas cards and after about twenty years, they gathered for a reunion in St. Louis. Every five years following they would meet, often traveling together with their families.

As the fortieth anniversary of their graduation approached, a new class project was proposed. On one of their reunion trips, over cocktails on a cruise in the Mediterranean Sea, **Jim Kotas (EE 68)** made a pitch to fellow classmates **Jim Neuharth (ChE 68)**, **Dennis Krause (EE 68)**, **Don Orton (EE 68)**, **Wayne Binfet (EE 68)**, and **Craig Nordby (EE 68)** to set up a class of 1968 scholarship endowment fund.

The goal was to make it possible for future high school seniors to attend Mines, pursue an interesting and challenging degree in engineering or science, and have as much excitement and fun applying that degree to their careers as the class of '68 did. It was also a way to show gratitude for the value of the education and guidance they received during their college years.

The project quickly took shape with team captains Nordby and Binfet in charge of recruiting leaders from each major. Their role was to inform their classmates about the

plan and encourage them to participate in time to meet the goal by the anniversary year. With only two years to initiate donations and pledges, a rally slogan of "40 by 40" to represent the goal of \$40,000 by the fortieth year was developed.

Kotas began sending out a regular newsletter to encourage classmates to participate. As the endowment grew, so did excitement for the project. Around 30 percent of the class has contributed so far.

The results exceeded the original goal and the first scholarship was awarded in 2008, forty years after they tossed their senior hats in the air. Each year since, a new scholarship has been awarded with the eleventh one to be presented to an incoming freshman this fall.

To be eligible for the award, the student must be a deserving incoming freshman and American citizen who achieved high scores on college entrance exams like the ACT. Several of the scholarship recipients have graduated or are still at Mines, which demonstrates the fact that 87 percent of freshmen who receive a scholarship return for their second year. Even more compelling is that 74 percent of scholarship recipients will graduate compared to only 21 percent of freshmen who do not receive a scholarship.

In the early to mid-1960s, you could complete four years of school at SD Mines for about \$5,000. At that time, a student could take as many credit hours as they wanted for just under \$300 a semester. The price per credit hour was raised around 1965 and it was about \$1,200 a semester. Even with that cost increase, a student could typically pay for a full year's worth of tuition on summer job earnings and a small scholarship.

For the original six alumni who came up with the scholarship plan, the ability to give back and fill the need for scholarships is personal. They are thankful for the financial help they received while completing their education at Mines because it prepared them to compete with the best engineers in the world.

Neuharth received a scholarship for \$50 which helped offset the cost of tuition. Krause received a Surbeck Scholarship, one of the university's top awards, all four years at Mines. Both Neuharth and Krause worked summer jobs as well. Nordby had a variety of scholarships, including one from Caterpillar.

Kotas had a Surbeck Scholarship and one other for two of his four years on campus. He also worked various part-time jobs including delivering furniture in an old Studebaker truck. After graduation, he worked for General Electric at Cape Kennedy on the Apollo program for Apollo 8 through 15 and helped develop some of the first visual flight simulators for Navy and Air Force pilots.

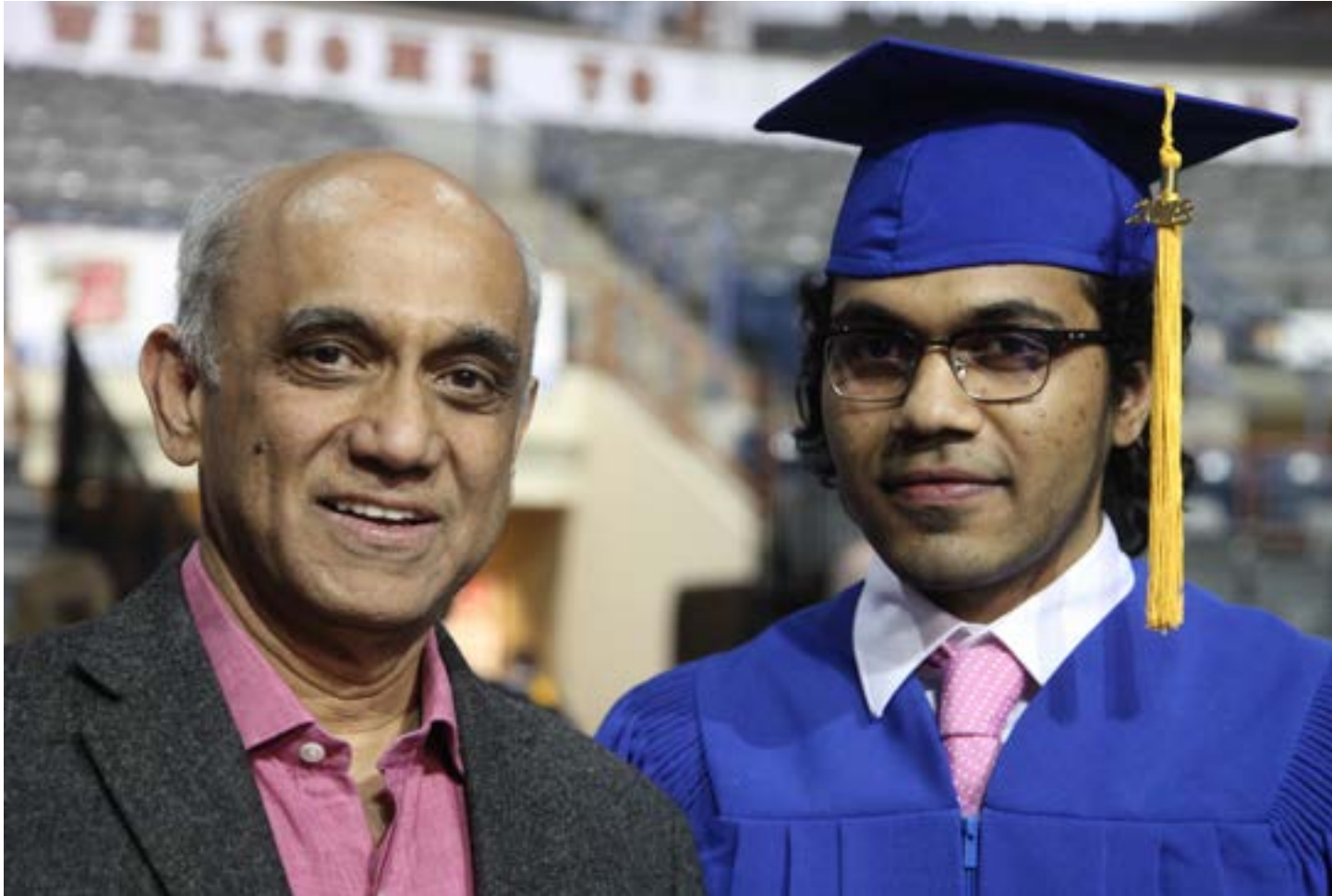
Unfortunately, Binfet missed the scholarship application deadline before deciding to attend SD Mines. He borrowed \$500 for tuition his first year and thought he would never be able to pay it back. Over the next three years, he worked three part-time jobs to cover costs. "My grades really suffered and weren't as good as I wanted them to be because I was working so much," he said.

As the saying goes, "The days are long, but the years are short," and the years have certainly passed quickly. The class of 1968 was recently back on campus for their fiftieth reunion. Stories were told, memories were relived, and many expressed disbelief at how fast half a century had gone by. To memorialize their fiftieth anniversary, the classmates have been encouraged to add "another \$50,000 by 50" to the endowment by the end of this year.

The world needs exceptional engineers and scientists and Mines has always met this call. Much has changed at SD Mines since 1968, but the challenge remains the same: find high school students who have a strong interest in math and science, encourage them to pursue a difficult degree while making friends along the way, and provide some financial support to assist them in accomplishing that objective.

GOA TO MINES

First Fomento Scholar Graduate



For **Lyle Vaz (ME 18)**, graduating from Mines with gold tassels paved a path to a new future. Shortly after commencement, Vaz moved to Tucson, Arizona, where he now works in the engineering department at the copper mining company Freeport-McMoRan. “The degree from Mines opened up a lot of opportunities that I didn’t have before,” says Vaz. The fantastic return on investment at Mines “allowed for

more freedom with deciding my career path,” he adds. None of this would have been possible without **Auduth Timblo (EE 71)** and the Fomento Scholarship. In 2013, Timblo started the scholarship program and named it after his family business, the Fomento Group in Goa, India. Each year, the Fomento Scholarship provides needs-based funding for four to five aspiring engineers from Goa. Timblo

says the scholarship aims to provide Goa with the next generation of leaders, and he expects Fomento Scholars to give back in order to continue this program for many more years. Vaz plans to fulfill this goal. He wants to give back to the Fomento Scholarship and says his fellow scholars are planning to do the same by getting more involved with the Fomento Scholars program.

IN MEMORIAM

*The names below include those who have passed (based on our database records) in the last 10 years, but whose names have not appeared in a previous **Hardrock** magazine. Please contact us if you know of any errors in this list. Going forward, it will be helpful if you share information about the passing of alumni you may know. The names below were received by July 24, 2018, and are listed by year of graduation.*

Gerald Eaton (ChE 35) 1/28/14
James Norman (CE 40) 6/20/18
Dale Doerr (CE 42) 10/1/14
Robert Lewis (GenE 43) 9/2/17
Robert Kulpaca (MetE 44) 12/19/16
V. Mitchell Liss (ChE 47) 2/1/17
John Parden (ME 48) 4/5/18
Robert Solheim (CE 48) 4/16/17
John Dragseth (ME 49) 11/29/17
Harry Head (EE 49) 4/27/17
Bernie Schmucker (CE 49) 1/25/18
Donald Schoessler (ChE 49) 11/15/17
Bernie Biberdorf (EE 50) 3/29/18
Jack Hopper (MetE 50) 11/3/16
Roger Kehm (EE 50) 7/16/18
Charles Meyers (EE 50) 4/19/18
Nordeen Taschner (ChE 50) 5/4/17
Charles Wagner (Chem 50) 7/7/12
Seth Wilson (MetE 50) 12/27/17
William Crawford (GeolE 51) 7/8/18
Lars Jorgensen (EE 51) 3/7/16
Donnelly Oliva (EE 51) 4/4/18
Alvin Pihlaja (EE 51) 5/9/16
Ward Spear (EE 51) 3/28/14
Albert Stoick (MinE 51) 9/9/15
Donald Ortiz (ME 53) 12/9/17
Robert Wynn (ChE 53) 6/12/17
Fredrick Escherich (EE 54) 12/28/15

Dick Szymanski (ChE 54) 11/6/15
Harold Rabke (GeolE 55) 6/9/16
Jerald Yocom (MetE 55) 1/14/16
Chuck Gukeisen (GenE 56) 3/2/18
Robert Walker (EE 56) 9/19/17
Bob Gregory (ME 57) 12/17/17
Edmond Babayan (CE 58) 3/4/16
Henry Johnson (MinE 58) 3/14/16
Dennis Pesall (EE 58) 5/13/18
David Strasser (EE 58) 2/9/18
John Carter (EE 59) 2/15/11
John Kukura (ChE 59) 3/6/18
John McCorkle (ME 59) 5/15/18
Roscoe Wells (ChE 59) 9/28/12
Ed Bane (MetE 60) 2/18/18
Wayne Hall (EE 60) 4/24/18
Arthur Hay (CE 60) 2/8/11
Terance Hughes (MetE 60) 3/10/18
Ken Hydingen (MetE 60) 4/22/16
William Conway (GeolE 61) 3/31/08
Anthony Tysdal (Chem 61) 9/15/17
Meherwan Boyce (ME 62) 12/21/17
Odean Jukam (ME 62) 3/25/18
Charlotte Urban (Math 62) 1/10/18
Larry Deeg (ChE 63) 3/9/18
Richard Gnirk (ME 63) 4/1/18
Larry Madsen (EE 64) 3/11/18
Myron Visser (EE 64) 7/9/18

John Korpi (EE 65) 5/23/16
Tom Marty (GeolE 66) 9/23/17
Larry Nelson (EE 66) 10/25/14
Philip Helgeson (CE 67) 9/24/12
Lauren McDaniel (EE 67) 11/28/17
James Clement (ME 69) 4/25/17
Clifford Harrison (ME 69) 8/11/14
Roger McCoy (CE 71) 1/9/18
George Guthrie (Math 72) 12/3/08
Dennis Schnabel (Phys 72) 2/26/18
Myron Hammer (ME 74) 2/18/16
John Malsom (EE 75) 4/3/18
James DeVries (MS Phys 76) 11/1/17
David Halvorson (EE 76) 10/14/17
Diane Coker (MS GeolE 81) 3/5/18
David Pendleton (ME 86) 4/25/18
Nancy Neuharth (ChE 88) 11/4/17
Karen Swindler (ChE 88) 7/22/18
Jagannadha Kodali (MS CSC 92) 9/29/09
Sandra Feist (IS 95) 3/6/18
Clayton Voyles (EE 95) 5/10/18

Community
Chuck Lien (Honorary 77) 4/7/18
Former Faculty/Staff
Cy Cox (EE Professor) 5/26/18
Dan Redin (Phys Professor) 5/30/18

1940's



Doug Fuerstenau (MetE 49) “We were on the East Coast when the disastrous fires struck northern California last October but did experience major losses. Our daughter in nearby Glen Ellen lost everything. A storage shed built for me on their property burned with all of my professional papers, memorabilia, and thousands of Kodachrome slides. My B/W photos were in Santa Rosa and survived. The photo was taken in the spring of 1947 when Paul Fenske (GeolE 50), my brother Maurie Fuersteanau (GeolE 55) and I hiked up Mt. Rushmore, an easy thing to do back then.”

1950's

Owen Tripp (ME 50 / MinE 51) “Maybe some of the late 40s/early 50s grads can write up something about the "Sophisticated Swingsters" that was made up of Mines students. I was one of them, but I can only recall **Rod Price (EE 52)**, the organizer, and **Don Hammerquist (GeolE**

50) [deceased]. We had a good time. Once, we took a job over in Wyoming for a barn dance, about a three-hour drive, one way. Two mistakes: first, the participants of the dance would not let us go until 3 am; second is the three-hour drive return. For me, it was a physics test at 8 a.m., getting 48 and flunked ... Dr. Cook would accept only the lab work. The only thing good about this gig was the money. Sorry, my recall of 94 years is not better.”



Lowery Smith (GeolE 51) (2nd from right) “Mary Ann and I were able to spend three weeks on the Big Island in Hawaii in February. We were joined by our three sons and two of their spouses for a week. Great time to get out of Minnesota winter. Had shoulder replacement in October. Now working to get more use so I can compete in the Minnesota Senior games in August. Feeling very blessed.”

Ken Urban (CE 53) “Doris Redfern and I were married two days after graduation. We will be celebrating our 65th anniversary in Homer, AK. We're going up there for the wedding of our granddaughter. Doris and I are still healthy and mobile. I take my guitar and play at a few nursing homes.”

Joe Hansen (ME 54) “Mines gave me an excellent education and enabled me to have a great employment at The Boeing Company aero space division. I took 2 years off in 1950 when the Rapid City National Guard was activated during the Korean War. This was a good time for students, back when it was possible to work your way through college. For two years I was part of the kitchen cleanup crew to earn my meals at Connolly Hall. Tuition was \$50 a quarter. I pledged Theta Tau in 1952 when I returned from Army duty. While at Boeing, I earned a Masters degree at the University of Washington, and had no trouble passing the exam for the Washington Professional Engineering License. My assignments included B-52 bomber design, Minuteman Ground Handling, supervision of The Saturn V first stage fuel tank structural test, Lunar Rover frame design team, Mariner Venus Mercury spacecraft lead engineer for the structure, & a few other small projects. I went to work at Tennessee Valley Authority in 1975, as a piping analyst for Nuclear Power plants.”

Dan Dake (CE 55) “Nadine and I continue to live in our home in Sandy, UT after 30 years. I retired from the Federal Highway Administration after working on the Interstate Highway System and related highways throughout the country and projects in Bolivia, Pakistan and Turkey. Two of our three children live nearby in the

Salt Lake City area, the third in Reno. Our health is pretty good with no serious problems but old age is creeping up and as a result we travel very little anymore.”

Roger Stapf (ME 56) “We are still migrating from our place in Fort Myers, FL, to Hillsboro, IL, for the summer. We have a nice lakeside vacation home in Hillsboro. In June of 2017, Marlene and I were blessed to celebrate our 60th wedding anniversary with a family gathering in Clayton, MO.”

Rod Iwan (EE 56) “I have sold my home and am now living in Brookdale Senior Living facility in Titusville, FL. Since I have passed 90, I did not have enough energy or strength to continue the upkeep of a 2400 sq. ft. home and an acre plus yard.”



Roger (GE 58) and Dolores **Kiel** have now been residents of Sedona, AZ, for 18 years. “The longest we’ve lived anywhere. We believe our environment and weather and scenery compare favorably to any national park. Our routine includes traveling to new and interesting US and international locations as often as we are able, visiting our family and friends. Friends from the class of ’58 that we visit often

include **Hal Nelson (GE 58)**, **John Wooley (ChE 58)**, **Clark Vanderlinden (ME 58)**, and Ev Kjerulff’s widow, Anthea. Although enjoying participating in a variety of volunteer boards, including the Mines Alumni Association and the Foundation, I’ve cut back to see if I can finally learn what retirement is supposed to be. Photography is my main hobby and one that requires me to keep learning on an almost daily basis. Meanwhile, we remain healthy and express daily gratitude for our good luck.”

Keith Wellman (Chem 58) “After graduating from Mines, I went to grad school in Chemistry at Northwestern, post-docked with Carl Djerassi (Father of the birth control pill) at Stanford, and took a couple faculty positions before ending up at University of Miami for about 35 years. I retired in 2005 and we live just southwest of Miami. Pass time sailing and camping on Gulf Islands of Everglades National Park. To avoid the heat in the summer, my wife (Nancy) and I go out to our place in Taos, NM.”

Gene Stienecker (GenE 59) “I have spent my entire career in Rockford, IL, working in the machine tool industry. I’ve had a variety of positions, mostly in management, in a business that has taken me to many parts of the world. I’ve been to the Berlin Wall and to the Great Wall in China. Guess you could say I’ve seen the world “wall-to-wall.” I have raised and educated my three kids here. Couldn’t persuade any to go to Mines.”

Bruce Johnson (CE 59) “Martha seems to be on the road to recovery from the awful pain of Trigeminal Neuralgia, so we’re grateful for that. I’m working about half time, trying to keep my brain in shape. My brother Roger came out from Rapid and we hiked up around Vernal and Nevada Falls in Yosemite National Park. A great experience! Keep up the fine work with the Alumni Association—your e-mails and the *Hardrock* keep us all in touch and interested in Mines.”

Ancel Lewis (EE 59) “I am still practicing as a Patent Attorney in Ft. Collins, CO, and still trying to get it right. I came to the School of Mines from Nebraska with **George Garlick (EE 58)** and we were roommates in college.”

1960's



Vance Stewart, Jr. (ME 61) with daughter **Kristin Stewart (ME 91)** have been racing a 1952 Ford Victoria 7 days and 2,000 miles across Mexico in the historic and grueling La Carrera Panamericana Road Rally since 2006. The 450 hp race car is

on a stock chassis, but features modern suspension, brakes, full cage roll bar, fuel cell and fire suppression. The team, which includes Vance Stewart, III, and best friend Rene Rodriguez, raced the Panam nine years in a row, earning 24 trophies with a best overall finish of 3rd in class. They now race every year in the Chihuahua Express Rally through Mexico’s Copper Canyon, and in April finished 3rd in class. In a second race car, Vance, Jr., AKA “The Geezer”, now navigates while Kristin pilots the 2005 Saleen Mustang. Kristin is in Golden, CO, working for a medical device manufacturer, Terumo BCT, and The Geezer still lives in Mexico and runs his company, Tumba Burros de Zacatecas, building brush guards and racks for trucks, and as he likes to say, “I’m still kicking!”

Dave Braun (ME 61) and wife Ann winter in Arizona and summer in Minnesota. Dave still performs jazz on cornet and flugelhorn and plays in his church praise band as well. Ann is golfing and playing Mahjong. “We are enjoying building a new home situated on a golf course previously owned by 3M. The course was re-designed by Arnold Palmer and Annika Sorenstam.”

Bob Stofft (CE 62) "I continue to enjoy spending time with **Bill (CE 61)** and Thea **Sheldon and Pete (ME 62)** and Connie **Knott** here in Arizona. I am fortunate to still be hanging around to watch my three teenage granddaughters become lovely young ladies. My good

friend Cherry and I still travel a bit including spending a few weeks in northern Mexico each year on the Sea of Cortez. A baseball team, the TOTS, composed of men over 60 years lets me play in Tucson a few times a week, all year around. I still cannot hit the curve ball. Proud of the successes of so many of our graduates. Well done!"

Rick Matson (ChE 62) sadly informed us that he lost his wife, Rosemary, to cancer on March 19. Rick and Rosemary were married April 10, 1960, while attending Mines and were an item for over 60 years. They had attended their 50th graduation reunion at Mines in 2012. Rick stays in touch with **Tom Snyder (ME 62)** and his wife Diane. Rick is lay pastor of Prairie Chapel UMC, an open country church between Columbia and Fulton where Rosemary was an active participant in the ministry of the church.



George O’Clock (EE 62) finished second in the 60 and up category in a 5K run. “Well, there were only three of us above 60. However, I did outrun a 10 year old kid. Also, on May 4, I graduated (again) with an

MS in biomedical engineering at the University of Minnesota; my sixth degree. Now, on to the seventh.”



Dave Mikkelson (Math 62) “I sadly report that my dear wife Bonnie lost a battle with colon cancer on April 23 at home with all our immediate family present. We married in Spearfish, SD, just a few days after my graduation in 1962. She steadfastly served with me on a 27-year Army adventure and well on into our retirement years here in Indianapolis, IN. Bonnie finished her BS degree at then BHTC in 1965 while I was on 'short tour' in Korea.”

Darwin Wika (ChE 63) suffered a stroke on April 3. (Sent by Kay Wika.) “He was in the hospital for two weeks and then at Bryn Mawr Rehab Hospital. The stroke affected his left side. He is using his dominate hand well for eating, although shaky. Unfortunately the blood is not being absorbed as quickly as usual so his mind is not working as it should. He knows us, so for that we are thankful. Speech has not been affected. The therapy he is receiving is very good. He has a very long way to go.”



Tex Longcor (EE 64) “Theresa and I had three great weeks in April in Australia and New Zealand. I bought a Crocodile Dundee hat, rode a camel, cuddled a Koala, and we toasted the sunset at Ayers Rock near Uluru, 300 miles from Alice Springs. We just missed seeing **Ray Rossi (ME 64)** when we visited Sydney. Our favorite vistas were in the Southern Alps of New Zealand and Milford Sound. From the tropics in Northern Australia to the snowy mountain range of The Remarkables in Southern New Zealand, the vacation we had was magical. The view of the Southern Cross and Milky Way from a cattle station in Australia’s outback on a cloudless night is awesome.”



Sam Begeman (ME 64) “After a 38+ year career at Esso, Exxon, ExxonMobil in the mechanical equipment field for refining, chemicals and pipeline/

production areas, retirement in 2002 was timely. We were fortunate to have experienced living in various locations, with over 15 years in New Jersey on and off (6 years off overseas), 16 years in Texas, and now 16 years more retired in Kerrville, TX. Mines prepared me well for my career, and several family members (3 brothers, our son, and a niece and nephew) have also graduated from the Mines. A real high point was returning to Mines for the 50th year anniversary. This is a tradition to continue! I and another alumnus **Houston Bashus (MinE 13)** have been engaged in getting the ‘San Antonio-Kerrville-Fredericksburg’ Alumni Chapter kicked off, with periodic get to gathers—everyone is welcome.”

Norm Hansen (EE 65) “I have developed a new source of energy called "Mirror Energy," which is for the conversion of matter directly into electricity or propulsion according to Einstein’s equation: $E=mc^2$. There are unlimited opportunities.”

Frank Hahn (CE 66) “I am currently working with **Brad Johnson (EE 92)** to create a contest for a unique design for my future headstone in the Doland, SD, cemetery. I am currently in great shape but eventually will be the 4th generation Hahn there. The design chosen will receive a \$10,000 scholarship to be awarded in their name. More info will follow.”



Terry Rothenbuehler (ME 66), Ed Opbroek (CE 66), Larry Baruth (ME 66), Dave Kramer (MetE 66). Ed Opbroek (CE 66) writes “I am mostly retired although we still operate Opbroek Consulting International, Inc., where I serve as advisor to assist the new director and to help mentor the engineers and communications people who handle World Auto Steel projects. They call me ‘éminence grise’ - a french word to describe ‘the old gray man in the background who counsels the king.’ Very much enjoy our tradition of joining **Larry (ME 66)** and Jan **Baruth, Dave (MetE 66)** and Margie **Kramer**, and **Terry (ME 66)** and Barb **Rothenbuehler** for five-year reunions and especially for the 50th anniversary of our graduation in 2016 [photo].”

Rich Heizer (ChE 67) “After a 50-year career in industrial wastewater treatment at several companies (last 22 at Baxter Healthcare) I continue my “retirement” with Heizer Engineering, designing on-site wastewater systems for residences and small businesses. Keeps the wife happy and my mind sharp. Not many young engineers want to jump into this line of work. Will travel to Ireland this summer (50th anniversary). First time across the pond for Sue. Our three children and seven grandkids keep us busy (IL, UT, and

OR), plus a 5th wheel in the Black Hills to relax in. Really enjoyed the 50-year graduation last spring. Best wishes to all.”

Harold Bross (MetE 68) “Marge and I have traveled extensively since I retired from Shell Offshore Production in 2006. Since we have lived in the New Orleans area for 45 years, we decided to retire here. I have been active with the United Way as a donation coordinator. I am also involved in the Larry Hatchett Fishing Foundation which takes foster children fishing in the Gulf of Mexico. Last October, we brought 160 kids, ages 6 to 18, offshore on a charter boat. Although the kids are from southern states, many had never seen the Gulf of Mexico. I am looking forward to attending the 2020 Mines reunion.”

Marlin White (EE 69) took a pre-retirement leave of absence from IBM in 1993 and returned to South Dakota and worked as a shop keeper, wood carver, and carpenter. “I started a handyman repair/remodel business in 1995 and this business has kept us busy to this day. I formally retired from IBM in 2000, moved to Fuquay Varina, NC, in 2007 to be near grandkids and continue to work the handyman business. Nancy and I enjoy travel and usually take an extended trip to South Dakota and the Southwest each year to visit family and friends. Life is good!”

1970’s



Mary Korinek and **Glenn Beusch (EE 70)**, Linda and **Larry (ME 72) Pearson, Jim Cameron (ChE 71)**, and Jeanne and **Gary (ME 70) Callahan**. On April 25, 2018, Men of Omega met at BeDillon’s Restaurant in Casa Grande, AZ, for the first of Glenn’s retirement parties. Good food and conversation were enjoyed by the group. Happy retirement, Glenn!

Les McNeely (EE 70) “My wife Judy and I are in Mesa, AZ, enjoying the 100 degree heat as we are waiting for spring to come to the northland. We extended our stay here for an extra 2 weeks before going back to the Twin Cities. We will spend the summer at Mille Lacs Lake. Hopefully the ice is out by fishing opener. Have a great summer everyone. I look forward to seeing the next *Hardrock* magazine.”

Bob Norman (EE 70) “I retired in 2004, but keep active in various engineering activities. I have 208 patents granted. Also, I received the lifetime achievement award in Flash in 2015.”

Joe Vig (CE 71) “Had a great time at the State AA Basketball Tourney when Patti and I flew back for 4 days, as the Yankton

Bucks and grandson Rex Ryken won the first title for Yankton in 40 years! A great achievement for a #11 seed.”

Karl Gerdes (ChE 71) retired from Chevron in 2013. “We moved from the hectic San Francisco Bay Area to college town, Davis, CA. Don’t miss the traffic. Doing a fair bit of travel and a “hobby level” of consulting. Received Lifetime Achievement Award from GPA Midstream Association at the 2018 Convention in recognition for 33 years (and counting) of service on the Research Committee. Enjoyed being able to razz one of my former students from UC-Davis (taught during my PhD studies) who is now the president of Colorado Mines, when the Hardrockers ended a 100+ year losing streak in football last fall. We were there!”

Paul Christensen (ME 71) “Barb and I will celebrate our 50th anniversary on August 18 at Holy Family Church in Decatur, IL. Alumni and friends are welcome to join the celebration!”

Donn Taylor (EE 71) “Sharon and I are back to Minnesota after the winter in Sun City West, AZ. We both volunteer locally at the June Bloomington Crime Prevention Book’Em book sale which donated over \$120,000 to local community needs. \$1 softcover, \$2 hardcover. By chance, this winter, I got paired up with classmate **Bill Nowell (EE 71)** in a golf league in Sun City West.”

Randy Nelson (GeolE 71) has finally retired from his position as sales manager, Hobas Pipe USA. “I turned 70 on May 8. Jackie and I started retirement on May 11 with a two-week trip to Prague, a Danube River cruise, and Budapest. I am looking forward to more golfing, more traveling and more time with the five grandchildren, ages 4 to 12. Jackie reminded me that though I am formally retired, I still work for her. I have been in the Dallas area for 39 years, having first retired from the City of Dallas in April 2003. I still get back to Sioux Falls to visit my two brothers and am looking forward to the next Mines reunion. I enjoyed the recent alumni event in Richardson.”



Sitting: **Dennis Schnabel (Phys 72)** and **Dennis DeWilde (MinE 72)**. Standing: **Neil Quitsch (ME 72), David Cappa (CE 74), Kurt Haufschild (EE 72), Clyde Ericsson (MetE 72), and Lance Swanhorst (CE 72)**. Classmates from their time at the School of Mines got together in early February for a reunion of sorts near Mercer Island, WA. “We had about a week together, spending much of our time visiting and going through some annuals from our years at Tech and enjoyed a Super Bowl Party.

All of the wives except for Neil’s, were able to join us, so they had a chance to get to know one another and to meet all of us guys.” **Dennis Schnabel (Phys 72)** passed away on February 26, 2018.

Wayne Kellogg (GeolE 73) “I’m still working for the Chickasaw Nation in Ada, OK. I work with our environmental and natural resource group. Susan and I recently took a trip to Tucson, AZ. Neither of us had ever been there, but we saw a special on TV and thought the area looked interesting. If anyone comes to Ada, I can show them the house Blake Shelton grew up in and the water tower he has on one of his album covers.”

Mark David (ME 74) “I am now retired after a 44-year career (24 industry, 20 forensics). Grandbaby #1, Serenity Mae, was born in May and we are care providers 3 days a week! Still based in Indianola, IA, with a condo in Florida for the winter. We would like to find a summer cabin in the hills. Love to hear from old friends at mjsdavid@msn.com.”



Alan (EE 74) and **Liz Bergeron** had an amazing 15-day adventure in Ecuador! “It was definitely a very wide diversity

of experiences from walking in the rain forest (day and night), exploring the streets of Quito, the oldest capitol in the Americas, a spa day in the Andes, a 7-day cruise around the Galápagos, and finally back to Quito for a farewell concert (performed by students at a special-needs school) and dinner at a museum! We were amazed and alarmed to learn how destructive human contact has been to the Galápagos. We ended our adventure with a trip to the equator where we learned a lot about the history of Ecuador and its people – we did not want the trip to end. The whole trip just took our breaths away time after time.”



Daughter Gretchen, granddaughter Anne Marie, and grandson Benedict Reetz, Mary and **Arlen (CE 74) Schamber**, and daughter Rachel Minerich. Arlen was recognized as the 2018 Minnesota Outdoor News Person of the Year for his work with conservation groups, helping the area’s youth in firearms safety, and working to ensure the city of Austin stays on high ground during periods of rising rivers. For the past year, Arlen has been providing engineering oversight for an in-progress 100,000-square-foot recreation center that will keep Austin active and occupied.

Larry (MinE 74) and Sherry **Messinger** made a second attempt at retirement by moving to Panama City Beach, FL, “Despite white sand beaches, emerald green Gulf waters, and a surprisingly moderate climate, we are still too busy with some consulting and community volunteering. We are much closer to children and our five grandchildren.”

Lindell Sunde (ME 74) “I’m planning another trip to Sturgis



Motorcycle Rally in August 2018. Last Sturgis outing in 2017 made contact with Eddie Jackson in Nebraska City, NE, **Rosie (Math 71) and Terry (ME 71) Bartels**, and **Michael Schmidt (GeolE 81)**. I retired in June 2018.”

John (MS GeolE 77) and Kathy



Dolan visited Easter Island (Rapa Nui) in February. “It is the MOST remote inhabited place on earth. It is 2,500 miles west of Santiago, Chile, and 2500 miles east of Tahiti. A most

fascinating and beautiful place.”

Chuck Michael (CE 77) “I am leading efforts to evaluate, design and construct the first commercial Hyperloop transport system in the world. We have several projects underway globally, and all projects have just a little Mines in their DNA. Our first project under construction is in Toulouse, France, with design underway in Abu Dhabi, and feasibility studies beginning now for a connection between Chicago and Cleveland.”

Ray Dennis (CE 77) “I am currently working for Westinghouse in Pittsburgh. My projects include support of the startup of the Haiyang Nuclear Power Plant in Shandong province in eastern China and helping with the preparation of a License Renewal Application for the Angra Unit 1 Nuclear Power Plant in Brazil. In my spare time I like to judge science and technology fairs for Middle School and Junior High School students. I was recently one of many judges for the Western Pennsylvania First Lego League Championships. The theme of the competition was “Hydrodynamics” and included oral presentations and the building of a functioning robot that had to perform preassigned tasks on a tabletop.”

Monty Hintz (CE 78) “I finishing my 40th year at Black & Veatch in the Kansas City area, still working in the Power Division. Our family visited the Mines campus last year during

a summer trip to the Hills. Our granddaughter has expressed an interest in engineering and we are hoping to fan those flames. A walk around the campus on a nice summer day may have helped.”

Mike Dahl (MinE 78) “Spring has sprung in southwest Wyoming. Golf and fishing are on! I have been retired since spring 2012 and enjoying every minute of it. Fly fishing, spin fishing, upland game hunting in North Dakota and Wyoming, ice fishing, golf, camping, and Knights of Columbus keep me busy. I maintained my Drinking Water Certification and conduct daily sampling/analysis/reporting for the Rolling Green Country Club during the golf season. I did a stint of consulting but prefer the retired life. I make it back to my home in North Dakota 3-4 times a year to help out my mother. My wife Linda retired three years ago and is an avid reader, crocheter and golfer. She was a speech therapist for the Green River School District for 40 years and a native of Rock Springs and graduate of the University of Wyoming. We have a 12.5 year old chocolate lab that was a super hunting dog but has been retired from hunting for the last two years with arthritis. I periodically see **Jim Spurrier (MetE 79)** and **John Schanzenbach (MinE 77)** around town.”

1980’s

Neal Schlottman (CE 81) “Susan and I are living in Rapid City where I continue as president and chairman of SECO Construction, Inc. We are a commercial building contractor providing services mostly in western South Dakota. We have been blessed with a good economy and construction has been strong in the Black Hills. Hard to believe that we have been back here since 1990! I have always had a passion for beer as many of you know. I decided it was time to get into the craft beer industry and started Dakota Point Brewing, LLC with two partners. My partner and head brewer Dave Eddy solicited help with the initial brewing from his brothers and fellow Alumni **Brett Eddy (EE 81)** and **Bart Eddy (ChE 81)**. Was great to see them and catch-up after many years. The brewery is located in “The Gap” in the old Landstrom’s building. Stop by and see us if you are in town!”



Rae [Kary] Staab (GeolE 81), **Michelle Hall (GeolE 81)**, **Cheryl [Walter] Aust (GeolE 81)**, **Lynn [Parks] Aleshire (GeolE 81)**, **Tami [Stroh] McKenzie (MetE 81)**, **Charlene [Wells] Dubs (Met E 81)** and **Karen Jass (MinE 81)**. “The girls from

SD Mines 1981 decided we would all get together a couple years ago in Arizona. In 2016, **Cheryl [Walter] (GeolE 81)**, and **Gerry (ME 81) Aust** hosted the group in their home in Medford, OR, in October 2016. We all enjoyed visiting and touring some of the local wineries and cheese factories in Oregon. We are going to continue the tradition with a Great Smoky Mountain get together in 2018 at Charlene’s house.”



Al (EE 82) and Pam **Goldschmidt** with two men from the Masai tribe near Arusha, Tanzania.



Roger Hall (CE 83) was recognized as the 2017 South Dakota Professional Engineer of the Year.

Mark Marty (MetE 83) “I have just retired as a captain in the Navy after 30 years. After commanding the USS Rode Island, I spent six years at US Strategic Command responsible for targeting all US nuclear weapons. I finished my career at Navy Strategic Systems Programs setting requirements for the future sea-based ballistic missile. Life has Barbara and I back in South Dakota on our farm, 'Fair Winds Orchard and Vineyard' in Tyndall that we started 10 years ago. We will continue to commute part time to both Omaha and DC for consulting work with the Navy.”



Sitting: **Harley Baumeister (ME 84)**, Beatrice Baumeister, **Kay Baumeister (MetE 85)**. Standing: **Jordy Baumeister**, **Trent Baumeister (CE 12)**, Alex Baumeister (future Hardrock), **Carissa Baumeister (EnvE 11)**, and **Brett Oliver (ME 11)**. Harley is working as a supply chain manager at TetraPak in Winsted, MN. Kay is the Quality Manager at Worldwide Dispensers in Lester Prairie, MN. Carissa is working as an environmental engineer at the Pine Bend Refinery/Flint Hills Resource in Rosemount, MN, and Trent is working as a civil engineer at Clark Engineering in Aberdeen, SD. Harley and

Kay have lived in Hutchinson, MN, since graduation but are eagerly planning to move back to the Hills in retirement.

Tim Ames (ME 86) is still at NASA and presently the associate chief of the Crew and Thermal Systems Division. “Our workforce supports multiple programs including ISS, Orion, Commercial Crew, and evaluates new technologies for human space exploration. At home, our youngest will graduate high school next year, and we are looking forward to an empty nest with retirement approaching in the not too distant future.”

Sandi (Miedema) Arnold (Math 88) “I received my Masters of Arts in education -mathematics on May 5, 2018, from Chadron State College. Currently I am an educator in math and science at Meadowlark Academy, part of Rite of Passage, a group that works with adolescent juveniles in crisis.”

Rich Schmidt (CSc 88) “After 30 years at Shell, I retired June 30 and began the next phase of life with my wife of 29 years, Dana. We will stay in the Houston area near our daughter, while our son Zach is moving to Tucson to work for Raytheon which is exciting but far away for mom. I enjoyed a robust career in IT spanning almost every role and business we have, but now look forward to more time with my family focusing on health, travel, hobbies (cycling, poker, chess, etc.), family, and

charity. If in the area, we can meet up if we are at home or our lake house. Feels weird to have travel plans after having been to 50+ countries and lived abroad, but will have a fun lens versus work!”



Bud Hendrickson (ME 88) “Lots of changes—four job changes, wife diagnosed with terminal cancer and her passing, built and moved away from a forever home in California to Washougal, WA, and published a book *Enjoy Your Journey*. My two boys, two grandpuppies, and two sisters live in the area. I have been dating a lady from Vancouver, WA, for 10 months and have found dating in your 50s is much different than in your 20s! I now work for Owens Corning and lead a maintenance team that supports an asphalt shingle manufacturing plant and an asphalt plant six miles away. I am involved with the Millwright and Maintenance Electrician apprenticeship committees where I have four apprentices at any one time getting electrical licenses. Development of maintenance teams has been my focus for the last 20 years. I hope to see some students from Mines this summer as I am going to volunteer at SAE's Mini Baja competition in Washougal, WA!



Dwight Eisenbraun (CE 81), Jon Maki (MetE 82) and Todd Roth (MetE 88)

Todd Roth (MetE 88) “I’ve been up in Northern Minnesota for the past 4 years and love being back, and able to work with the folks on the Iron Range. I see **Tim Bungarden (MetE 87)** once in a while.”

Chris Smith (EE 89) “I was recently promoted to Engineering Principle Fellow with Raytheon. This is the top of the technical ladder achieved by less than 1% of the technical population. My job as air warfare systems product line chief engineer, overseeing engineering for programs like Tomahawk and Sidewinder among several others, continues to be challenging and exciting. I continue to teach graduate courses in systems engineering for Johns Hopkins University in my spare time. My wife, Beth and I recently purchased a retirement home in Lead, SD. We are using it as a vacation rental until we are ready to retire in a few years.”

1990’s



Kristin Stewart (ME 91) on a vintage Honda 125cc she plans to race on the salt flats at Bonneville Speed Week.



Jackie (Moriarty) Flowers (CE 92) was recently selected as the next Director for Tacoma Public Utilities (TPU) in Tacoma, WA. TPU is one of the largest public utilities in the country. Flowers will manage a staff of more than 1,400 people, and oversee operations of seven hydro-electric dams, surface and ground water supply systems, a regional water system that includes three other regional utilities, and the short-line rail system in the port.

Baron Fidler (MinE 93) “I rejoined Dyno Nobel in May 2017, after three years supporting and promoting Atlas Copco blast hole drills with Cate

Drilling Solutions. I am glad to be back with Dyno Nobel. Our son Conrad is six and starting soccer and tumbling. Janna is a busy full-time mom and manages the house well. We still live in Draper, UT.”

Pat Carver (MetE 94) “Jennifer and I got married in 2012 here in Savannah, GA, and I’ve been here for over 10 years. I’ve been with Gulfstream Aerospace working in Design Engineering as an M&P and Lightning Protection Engineer for over 12 years and ODA Engineer Authorized Representative for 3 years. Jen just got promoted to Lieutenant Colonel in the Georgia Air National Guard in the 165th Medical Wing as the Optometrist. So we are pretty busy with work and life with paddling our paddleboards and outrigger canoe, surfing, yoga, and plenty of travel adventures. Life is good!”

Tim Burttram (EE 94) “Dawn and I relocated to northeast Arkansas in August 2014 from McMinnville, OR. I am the electrical engineering manager at Big River Steel in Osceola, AR (about 45 minutes north of Memphis on the MS River). We started up the new \$1.6B mill in 2016 and are looking to begin expansion soon. At the mill we have melting, casting, hot rolling, pickling/cold rolling, annealing, and galvanizing operations. I handle all of the power distribution from 230kV all the way down to 480V. The move to Arkansas allowed us to be closer to my home (Alabama). Our daughter

recently moved from NYC to LA and is pursuing a career in film and TV. We still visit the Rapid City area to see Dawn’s parents and it is always very nice to come to the Mines campus. I hope to make it the next reunion. One thing I have come to realize over the years is the value of a degree from Mines. I have worked with engineers from all over the world and from the likes of MIT, Georgia Tech, Cal Tech, Stanford, Cal Berkeley, Vanderbilt, etc. and SD Mines engineers don’t take a back seat to anyone!!”



Tracinda Yaw (ChE 96) “I just completed my 22nd year at 3M. My family and I currently reside in St. Paul, MN, but have lived in many states over the course of my career at 3M. We have two children, a son in 6th grade and daughter in 4th grade. I’ve worked in many businesses and manufacturing locations. I’m currently responsible for global manufacturing and supply chain operations for our Automotive and Aerospace portfolios. This role takes me all over the US, Europe, Asia, and Latin America. It’s an exciting role and it’s wonderful to experience different cultures around the globe. STEM education is near and dear to my heart and I enjoy working with schools

and non-profit organizations in this space. I still have a love for hiking that started while at Mines and my family and I travel to different national parks every year.”



Samar Al-Haj (CE 96) [photo: Hanah, Sarah, Manal and Omer Al-Haj] “My wife teaches at the only Arabic school in Colorado. Our oldest daughter is starting college to study civil engineering. Our family vacationed in Jordan for two weeks this summer.”

Shane Matt (CE 96) and his wife, Carol, are still living in Rapid City. Shane recently celebrated his 20th anniversary with FourFront Design, Inc., an architectural and engineering consulting company with Service-Disabled Veteran-Owned Small Business (SDVOSB) status. He is a principal and a senior civil engineer with FourFront. In October of 2017, Carol left her role as an administrative assistant at St. Thomas More High School (STM) to follow a new vocation. She joined Rapid City Regional Health’s Hospice of the Hills as a patient care technician and loves her role of taking care of terminally ill patients as well as their families.

“Our oldest son, Tyler, will graduate from STM in May and plans to attend the University of Mary in Bismarck, ND, and major in exercise science with plans for a doctorate in physical therapy. Our youngest son Riley will finish up his freshman year at STM.”

2000’s



Julie (Richter) (EE 00) and Derek **Ganz** welcomed a new baby girl, Bridget, to their family in November. “She is perfect and such a little sweetheart. Maternity leave went by really fast with two other littles, Piper and Fred, at home with their baby sitter. I continue to work at Digi International as a software engineer and enjoy running in my free time. I ran my 26th marathon in Brookings in May.”



Front Row: **Mary Harms (CEng 02)**, **Annie Thompson (MetE 98)**, and **Tiffany Snyder Ewing (CE 97)**. Back Row: **Jaci Bonhorst (IE 97)**, **Jeri Bonhorst (IE 97)**, **Julie (Richter) Ganz (EE 00)**, **Krystal (Shreve) Pruzinsky (ME 98)**, **Sara (Russell) MacDonald (EE 00)**, and **Heidi (Kramer) Watton (CE 99)**. The AOE ladies like a challenge and put their teamwork skills to the test at an escape room activity during a raging girls’ weekend in Savannah, GA. Not surprisingly, they impressed the staff with a no-clue record time of 38 minutes and made sure to leave a Mines tag on the graffiti wall. Other adventures included lots of gabbing, drinks by the pool, a trip to Tybee Island (to see the Atlantic Ocean and get some parking tickets), a hop-on hop-off trolley tour of historic Savannah, and getting an AOE shout out at the dueling piano bar.

Sarah (Rouse) Korman (Chem / MetE 02) PhD, JD, is head of intellectual property for drug delivery and combination products at Amgen Inc.

Stacy (Froelich) Myhre (ChE 02) was recently married to Derek Myhre, with a small ceremony consisting of family in Jamaica. Stacy is currently the Deputy Rural Water Manager for the Dakota Areas Office with Bureau of Reclamation. She was selected as Reclamation's 2016 Engineer of the Year and was named one of the top ten NSPE's Federal Engineers of Year in 2016. Stacy and Derek reside in Pierre, SD.



Congratulations to SD Mines alumnus **Michael Huot, (Chem 03)**, MD, who is the 2018 South Dakota State Medical Association Outstanding Young Physician.

Andy Farke (Geol 03), spouse Sarah Nichols, and oldest son Sam welcomed Peter James Farke to the family on July 26, 2017. Andy keeps busy with his work as a curator at the Raymond Alf Museum of Paleontology in Claremont, California, as well as his hobby of home brewing beer.



Justin Reisenhauer (Chem 04), MD, FACER, AME is an Emergency Physician working in North Dakota. He is also a commercial pilot. Justin and his wife started their own business to combine medicine and aviation passions, Reis Above Aviation, providing medical exams to pilots when he is not working in the emergency department. “I truly enjoy reading the Hardrock magazine and catching up on classmate news and updates on the school. The analytical mindset that Mines fosters, teachers/ staff, extra-curricular activities (Leadership Development Team for me), are all top notch, and have helped me excel in my career!”



Adam (ME 08) Ammanda, and Brendan **Lungren** welcomed the arrival of son, Jude, on March 12, 2018.

Andrea Porter (MSE MGT 16) completed a graduate certificate in marketing management from Harvard University. She is the director of extended studies at West Texas A&M University.



Brandon Fredrickson (MinE 08) and his family have accepted a new position with RPM Global that will take them to Santiago, Chile, for the next few years. Brandon will be the consulting team lead—Latin America.



RESPEC employees **Tyler Artz (MinE 15)**, **Pete Rausch (CE 10)**, and **Teresa (MS CE 94)** and Addison **Whitney**, participated in the 2018 Rapid City Polar Plunge. As part of the Rapid City Flame team, they raised over \$6,500 for the South Dakota Special Olympics. Teresa’s daughter Addison is part of the USA Special Olympics team and will be competing on the swim team in Seattle, WA in July. Teresa also received the Contributor of the Year Award for “outstanding and devoted efforts to Special Olympics.”



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1. 59 Alumni, 8 guests, and 25 Mines students attended the social at the SME Convention in Minneapolis, MN.

2. The San Antonio-Kerrville-Fredericksburg, TX, Alumni Chapter gathered on March 2, 2018, at The Grill in Leon Springs. Another gathering is expected around M-Day time in early-mid September. Pictured back row (l to r): Geoff Hawkins (GeolE 81), Clyde Ericsson (MetE 72), Sam Begeman (ME 64), Brogan Pappel (ME 14), Houston Bashus (MinE 13) and Lee Swindler (EE 88). Front row (l to r): LeTreace Hawkins, June Begeman, Suzi Gallagher, Thomas Grimshaw (GeoE 67) and Karen Swindler (ChE 88).

3. Waterloo, IA. Front: John Ludeman (MetE 95), Alexandra (ME 16) and Josh (Geol 14) Laird, Karen Buerkle (ME 01), and Paul Oien (CE 99). Back: Wayne Mills (ME 89), Trisha Ludeman (MetE 95), Bert (MetE 01) and Tracie Cantu, Ove Osen (EE 95), Trisha (IE 09) and Andrew (EE 07) Beckering, and Don Goeres (ME 66).

4. Cedar Rapids, IA. left to right: Dawn Recker (Chem 98), Anthony Schaefer (CEng 06), Lloyd Holecek (EE 60), Lance LeTellier (CE 89), and Jeri Lyn (ChE 94) and Brian (ChE 95) Bares.

5. Davenport, IA. Kodee Click (ChE 17), Brandon Antonine (ChE 17), Mark (ME 94) and Kelly Svitak, and Bruce Halter (MetE 89).

6. Green Bay, WI. Front row: Pam Belden, Sherry Mutchler, Steve Weeldreyer (ChE 71), Jane Barnes (ChE 79), and Kalie Friedel (ChE 16). Back row: Kerry Belden (ME 73), Keith Mutchler (ME 71), Lars Nordang (ChE 94), Roger (ME 77) and Jan McCambridge, Ronda Ferguson (ME 91) and Scott Gaeth (IE 92), Dylan Schiltz (CE 15), and Dave Wentland (CE 73).

7. Naperville, IL. Left to right: Orië Barnes (MetE 78), Larry Simonson (EE 69), Jeff Nielson (ME 95), Dale Bryson (CE 60), Donna Rardin, Steve (ME 71) and Paula Danekas, Leah (Novicki) Klapperich (CE 96), Bob Rardin (EE 62), Jim Zwijack (MinE 93), Norm Hansen (EE 65), and Felix and Steven (CSc 06) Larsen and Xochitl Lunde-Monzon (CEng05).

8. Kalamazoo, MI. Left to right: Bruce (MinE 82) and Tammie (GeolE 82) Frandsen and Anthony Amarasinghe (ME 14).

9. Midland, MI. Left to right: Tami Heilman-Adam (ChE 98), Evan Waddell (ChE 10), Erin (ChE 01) and Dan (CSc 00) Lacher, and Tom Workentime (ChE 84).



10. Cleveland, OH. Nate Cameron (MS MEM 16), John Rathbun (MinE 84), Steve Bauer (MinE 79), Gary Baker (ME 72), Allen Haberman (MetE 82), and Bob Merrill (ChE 73).

11. Pittsburgh, PA. Front row: Rachel, Terri, and Troy (EE 96) Delzer and Steve Uttecht (EE 92). Back row: Dennis Poage (EE 67), Booty Kuhns (GeolE 75), Tony (EE 80) and Janet Fishovitz, and Ray Dennis (CE 77).

12. Columbia, MD. JJ Pirtle (MinE 86), Jerry Jarding (ME 74), Dusty Johnson (CEng 06), Morris Range (EE 51), Marlene Blevins, Umesh (MS CE 84), and Uma Murthy, Dennis Blindauer (GeolE 71), and Andy (EE 89) and Joanne Svitak.

13. Cary, NC. Jerry (ME 77) and Gretchen Berreth, Avery Schick (ME 95), Chris Misterek (MetE 98), Jon Spargur (ME 61), Carolyn Schwarz (Chem 81), Val Dutcher (ChE 62), Marlin (EE 69) and Nancy White, and Mike Harris (CSc 83).

14. Charlotte, NC. Sherry Julius, Doug Fluke (ChE 82), Aaron and LaDonna (ChE 97) Ryba, Diana and Bill (ME 82) McMillan, and Gil (MinE 58) and Frances Rennhack.

15. Greenville, SC. Sitting: Cole and Sasha Smith, Cori (IE 05) and David (IE 05) Burnett, Holly Damiana and Bernie Tompkins (EE 70). Standing: Dave Wagner (ChE 69), Jed Smith (ChE 98), Dave Fitzgerald (ME 97), Daryl Boe (MetE 89), Kevin (ME 11) and Caitlin Morrow, and Bonnie McCourtie (ChE 80).



16. Atlanta, GA. Sitting: Kathryn Claxton, Jean Jeitz, Snow and Dan (ME 66) Williams, and Don Bachand (CE 77). Standing: Josh Green (ME 11), Ron Jeitz (CE 69), Del Gran (EE 66) Stacie (IS 05 and Mitch (CEng 05) Olson, Randy Wischmann (ChE 73), Brian Beuning (CSc 80) and Bill Jones (IE 96).



17. Chattanooga, TN. Morgan Powell (Geol 16), James Kenney (IE 09), and Robb Peterson (EE 87).



18. Knoxville, TN. Front: Charlene Dubs (MetE 81), Darla Roeber, Pat and Ev (MetE 63) Bloom, Jim Webster (EE 58), and Bruce Zerr (ChE 76). Back: Doug Roeber (MetE 69), Daryl Boe (MetE 89), Keith Jansen (CE 71), Jo and Bill (ME 73) Jones, and Dr. Sally and Dana (Chem 67) Peterka.



19. Nashville, TN. Anna, Carlie, Addie and Matt (MetE 07) Lyndoe and Kevin Millslagle (ChE 00).



20. Grapevine, TX. Omar El Kadi (CE 15), Mark Burckhard (CE 82), Ceri Klopp (CE 16), John Lesnar (CE 98), Danny (CE 62) and Mary Lou Lee, Jeff (IE 05) and Abby (IE 05) Wientjes, and Alex Klopp.



21. Richardson, TX. Front: Scott Marin (EE 73), Dennis (EE 73) and Peggy Case, and Al Dougal (CE 50). Back: Karen Marin, Jim Stoebner (EE 73), Arne Hatlestad (EE 73), and Dave Lichtenwalter (EE 75).

22. Richardson, TX. Mark Berend (MinE 78), John Obenauf (EE 82), Randy Nelson (GeolE 71), and Michelle Wanttie (CSc 00). Back: Mark Scott (GeolE 72), Doug Schultze (ChE 78), and Paul Ching (MS GeolE 73).



23. Richardson, TX. Front: Diana Peninger (ChE 87), Kim Rodriguez (Math 85), Gary Johnson (Geol 63), and Nancy Sandberg. Back: Kevin Peninger, Jeff Hiemstra (ChE 82), Reed Ashmore (EE 86), Dan Ptak (EE 86), Dan Wenzel (CSc 85), and Jerry Sandberg (Phys 56).



24. Tulsa, OK. Warren and Rita (EE 76) Neff, MJ Green (CE 78), Kayla Nemec (ChE 16), Barb Seder (Math 70), Art Anderson (EE 68), Alyssa Wildcat, Lin Seder (ChE 69), Jerry and Brandi Wildcat, and Jake Miller (ChE 17) and Victoria Wood.



25. Wichita, KS. Gary (IE 99) and Jackie Schmidt, Daxton, Dennis (ME 01), and Tara Clary, Becky Mitchell (CE 95), and Manny Penaloza (MetE 95).

26. Olathe, KS. Maura and Richard (CE 92) Wendland and Rachel and Matt (ME 09) Schulte.



27. Olathe, KS. Justin, Valerie, Emily, and Jason (CEng 05) Howe, Jenny Warring and Rob Herbst (CEng 08), Josh Sass (ME 05) and Gena Engel (ChE 06), and Terry Bartels (ME 71).

28. Olathe, KS. Nick Peeke (ChE 98), Spencer Ferguson (CE 14), Lance Kilburn (EE 14), Devyn Asche (CE 16), Tony Kulesa (CE 12), Jordan Landen (ME 17), Randy Monson (EE 70), Doug Colbert (ME 12), Bette Monson, Troy Eisenbraun (CE 80), Julian Brackins (CSc 15), Gina Rossi (CE 16), Melissa Montoya Mairena (CE 17), Derek Stotz (CSc 14), Lance Baum (CEng 16), and Lauren Keene (CSc 17).



29. Olathe, KS. Doug Colbert (ME 12), Dave Brucker (CE 97), Justin Wenner (ME 06) and Ben (MetE 97), Jill, and Katelynn Dines.



30. Houston, TX. There was a great turnout for the Mines Alumni Professional Networking event in Houston with panelists Mark Stoebner (ChE 69), Gaurdie Banister (MetE 80), and Steve Gassen (IE 97) sharing their professional career experiences. President Jim Rankin and Dr. Wendy Rankin were able to attend.



31. Alumni Weekend Golf Tournament at Red Rock in Rapid City. “It was great to see our alumni return to campus. Every time I have an opportunity to visit with Hardrock alumni, I learn something new about them and their experience. Thank you for coming back and sharing your experiences.” Joel Lueken, SD Mines Athletic Director.



32. Norfolk, NE. Jeremy Pirner (ME 12), Kody Heller (CE 12), Anthony Shearer (CE 00), Katie Schaefer (IE 13), Brook Bugenhagen (MetE 84), Travis Hanson (CE 02), and Sherwyn Braganza (CEng student).



33. Salt Lake City, UT. Front row: Norma Kost, Gina Bestgen (ME 17), Kelli-Ann, Bailey Ziegler, and Chrissy Sorensen (CSc 16). Back row: Kurt Kost (MinE 78), Corey Palmer (MinE 17), Karen (MinE 10) and Alan (ME 10) Bakken, Mike Cowan (CSc/Phys 12) and Sterling Ziegler (MinE 12).



34. Salt Lake City, UT. Front row: Laurie Brett, Dan (CE 55) and Nadine Dake, Mary Petik, and Forrest Miller (CSc 17). Back row: Dan Brett (EE 81), Terry Meidinger (ME 76), Rick Hanzlik (CSc 83), Bud Petik (EE 64) and Jason Ablott (GeolE 17).

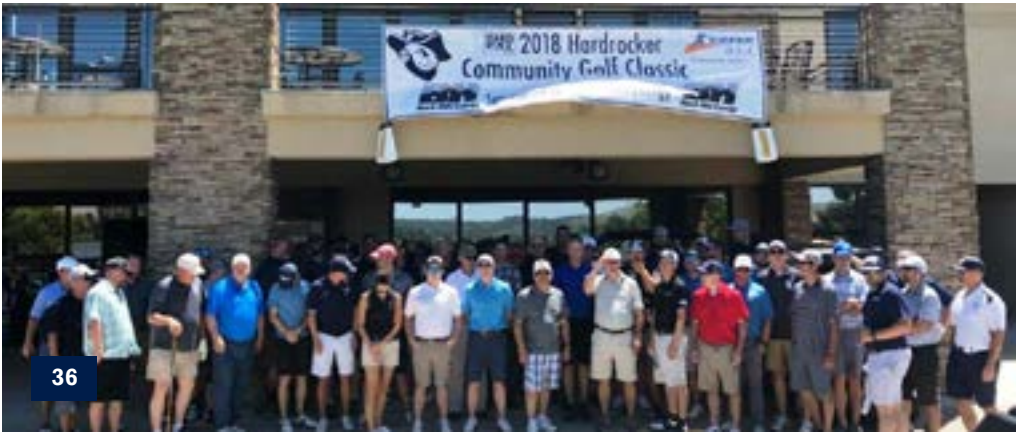


35. Salt Lake City. Front row: Gina Bestgen (ME 17), Chris Peters (MinE 12), Janna Fidler, and Irina Rose. Back row: Joe Mowry (CSc 16), Corey Mellegaard (ChE 96), Baron Fidler (MinE 93), and Warren (CSc 03) and Ariana Rose.

36. Rapid City. It was another perfect day in the Black Hills for the 2018 Hardrock Community Golf Classic sponsored by Black Hills Energy. A total of 70 golfers participated in the event.

37. Czech Days Parade in Tabor, SD. Left to right: Haley (fiancé) and Austin (ME 18) Kaul, Zoe and Jeff (ME 08) Schnabel, Ashley (CE 10) and Tanner (ME 11) Swanson, and Joe Rust (ME 07).

38. Rapid City, SD. Minrs graduates who supported Vicki Klar-Loomis (sitting in the wheelchair) by walking in the Rapid City ALS walk on June 23. Left to right: Greg Rolland (CE 79), Bruce Anderson (CE 81), Kent Christopherson (MinE 80), Tom Loomis (GeolE 82), Tim Ogdie (ChE 80), Scott Doom (CE 82), Jim Zwijack (MinE 93), and Kelli Wold (GeolE 82).





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BY THE NUMBERS:ESPORTS

70

Varsity Esports
programs in the
United States.

3,834

Esports tournaments
held for money in 2017

400,
000,
000

fans watched
Esports in 2017


\$1.5 BILLION
in total revenue by 2020

\$112,000,000 in total prize money in 2017





27,000,000 people play League of Legends **EVERY DAY**

over \$5,000,000 in scholarships awarded in the United States for 2017





SOUTH DAKOTA



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& TECHNOLOGY




8 Varsity Esports
Athletes at
Mines




120 Club Esports
members

200%

growth in players
and club officers
since Fall 2016.



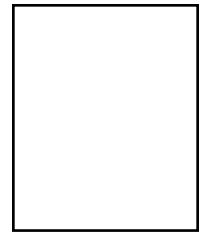


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For qualifying students with at least one parent or legal guardian who graduated from SD Mines!

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Nebraska Advantage

New freshmen and transfers from Nebraska are eligible

Minnesota Reciprocity

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