

# THE HYARDRILIX™

SUMMER/FALL 2019

SOUTH DAKOTA



SCHOOL OF MINES  
& TECHNOLOGY



# THE HARDROCK™

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

SD Mines Alumni Association  
330 E. Kansas City St. Suite 100  
Rapid City, SD 57701  
605.394.2347 / 800.394.2394  
alumni@sdsmt.edu  
www.sdsmt.edu/hardrock

Executive Editor  
Ann Brentlinger  
Managing Editor  
Mike Ray (Geol 97)

Photography  
Brian Hill  
Lynn Taylor Rick  
Mike Ray

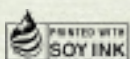
Writers  
Lynn Taylor Rick  
Mike Ray  
Stephanie Powers

Graphic Designer  
Brian Hill  
Desiree Rohrbach

Contributors  
Devereaux Library

About the Cover  
Austin Kaul (ME 18)

Forum Printing  
12,850 / \$.70



Don't Miss  
Hardrocker Homecoming Week

## SEPTEMBER 21-28

Come home to celebrate Rocker Days **2019**





# THE HARDROCK™



- 2** Alumni President's Letter
- 3** Flashback
- 5** From the President
- 6** Ask the Mines Expert
- 7** **Engineering in the Sky**
- 8** Build it and They Will Come
- 10** On the Shoulders of Giants
- 12** Bringing Solid State to the State
- 14** Humble Beginnings
- 16** **Connecting the Dots**
- 18** **Hyperloop**
- 20** **Talent Pipelines**
- 22** **Braun Student Inventor Award**
- 24** In Memoriam
- 25** Class Notes
- 33** Alumni Gatherings

## Alumni Association Board of Directors

### President

Susan "Booty" Kuhns (GeolE 75)

### President Elect

Lorin (MetE 75) &  
Mary (CE 77) Brass

### Past President

Greg Hintgen (EE 99)

### Treasurer

John Davies (ChE 71)

### Secretary

William Jones (IE 96)

### Board Members to 2019

Chuck Cox (ME 00)  
Jade Herman (IS 09)  
Melanie Jeppesen (IS 09)

### Board Members to 2020

Tyler Artz (MinE 15)  
Rose Luvaas (ChE 08)  
Anne Rizer (ChE 87)  
Steve Gassen (IE 97)

### Board Members to 2021

Jeff Allen (ChE 77)  
Mitch Nachtigall (IE 06)  
Chris Peters (MinE 12)  
Nicole Stengle (IE 03)

### Staff

Executive Director  
Shane Lee (MinE 10)

Executive Assistant  
Sarah Von Eye

SD Mines Alumni Association  
330 E. Kansas City St.  
Suite 100  
Rapid City, SD 57701  
Office: 605.394.2347  
alumni@sdsmt.edu



Greetings fellow alumni and friends of SD Mines!

Since the beginning of March, I have been on the road meeting so many alumni and friends in Pittsburgh; Washington, D.C.; Houston; San Antonio; Austin; Dallas; Tacoma; and Seattle. Most of these trips were conducted as a team effort with Drs. Jim and Wendy Rankin, Mines Foundation reps and our Alumni Association Executive Director **Shane Lee (MinE 10)**. The key word here is collaboration. By cooperating with our university partners, we are improving communication and engaging more intimately with the lifeblood of our university: you, our beloved alumni.

Our goals at the Alumni Association are simple. We want to engage more of you (with your unique and diverse time and talents) in building our alumni chapter base. We want you to participate in alumni events, to serve as campus presenters in your respective departments, be advisors to student organizations, serve on advisory boards, and become alumni recruiters working with our admissions office. In addition, the student connection to our Alumni Association is growing. We are creating more ways to involve our students, instilling in them the importance of communication and interaction with alumni on campus, participation in social and community outreach activities, and hosting professional networking events.

I have shared this story with so many of you, but I cannot emphasize its significance enough. Soon after my graduation, my father was having lunch back home in Ligonier, Pennsylvania. A gentleman approached my father and asked him if he owned the VW with the School of Mines sticker on it. He shook my father's hand and conveyed his congratulations to me. This gentleman was Senator James Abourezk from South Dakota. It made a lasting impression on dad. So my friends, it goes to show, whether you are a newly minted alumni, a manager, a VP, or even a U.S. Senator, the bond we share is that we are family. Alumni family. Hardrock strong.

Please save the date for our five-year reunion on July 8-12, 2020. **Scott (EE 75)** and **Linda Rausch (ChE 75)** are serving as co-chairs for this awesome event. No excuses please! We would love to see all of you there! In addition, we have moved our office to the new Pearson Alumni and Conference Center. A big thank you to **Larry (ME 72)** and Linda **Pearson** for their generous support of such a beautiful facility.

It has been a very good year serving as your president, and I thank you for coming out to our alumni events. I also want to thank all the members of our board of directors, Shane Lee, and special thanks to Sarah Von Eye, who keeps our office and everyone in it on track.

Sincerely,

A handwritten signature in black ink that reads "Susan 'Booty' Kuhns". The signature is fluid and cursive, with the first name "Susan" and last name "Kuhns" clearly legible, and the nickname "'Booty'" in the middle.

**Susan "Booty" Kuhns (GeolE 75)**

2019 President

South Dakota School of Mines & Technology Alumni Association





# FLASHBACK

## 75 years ago 1944

As World War II ends, the Army Specialized Training program at SD Mines comes to a close.

## 50 years ago 1969

The Institute of Atmospheric Sciences acquires armored T-28 aircraft used to penetrate thunderstorms. The research aircraft remains in operation for 30 years.

## 35 years ago 1984

SD Mines centennial year begins. This photo shows an early 1980s M Day celebration with students and President Richard Schleusener.

## 15 years ago 2004

Hardrock Hall of Fame inducts its first members.





A prairie dog at Wind Cave National Park in the Black Hills



Dear Hardrocker Friends,

Mines graduates have a long history of innovation that disrupts the status quo, shifts paradigms, and breaks molds. Our graduates contribute to cutting edge science and engineering projects around the world.

Many alumni also cherish fond memories of their time attending school in the Black Hills area. It's not just a wonderful place to play outdoors, it's also a fantastic place to live and raise a family, but too few have found the opportunities and quality employment needed to remain here. In past decades, many of our best and brightest graduates have left the Black Hills for lucrative positions in industry elsewhere.

This trend is changing today. The university is in the center of an exciting new effort to promote and nurture ideas that spin off into successful new companies. This effort is creating high-paying jobs and entrepreneurial opportunities for recent graduates and experienced alumni alike. The new Ascent Innovation campus will soon be under construction. This state-of-the-art facility will include the resources needed for high-tech startups to thrive. The ongoing world-class research at the Sanford Underground Research Facility and the announcement that Ellsworth Air Force Base will house a new fleet of B-21 Raiders offers expanded opportunities for Mines graduates in this part of the world.

This issue of the *Hardrock* magazine looks at the culture of innovation and entrepreneurship unfolding around Mines. This includes an article on Property Meld, a company co-founded by alumnus **Ray Hespen (MinE 09)** and nurtured at Ascent Innovation. This is one example of many new and successful businesses started by alumni in the Black Hills. We also feature businesses that employ students as interns. In the article, "Talent Pipelines," we show how these companies are creating successful models for managing future workforce needs. We wouldn't be where we are without the talents of those who pioneered the way before us. "On the Shoulders of Giants" features a few of the many entrepreneurs who started successful tech-based companies in South Dakota.

It's true that the alumni of our small university have a global impact, and this won't change. Today, more of the brilliant young people who graduate from our university are able to stay in the area and contribute to our economy. The future in this area is bright, and we're excited to help it unfold.

Warm Regards,

A handwritten signature in black ink that reads "James Rankin". The script is fluid and cursive.

Jim Rankin, PhD PE (EE 78)

President

South Dakota School of Mines & Technology



## Ask the Mines Expert

**Joseph Wright**

Associate Vice President for  
Research and Economic Development



**Is the Black Hills region poised for a tech-based economic boom? If so, why?**

I believe the Black Hills area has the potential to see significant growth in its technology-based business sector in the near future. There are a

number of factors that lead me to this conclusion.

The Black Hills attracts talented people who fuel this kind of growth. Our beautiful surroundings, vibrant growing cities, and quaint small towns are places people want to live.

A number of technology-related developments are coming

to the area and, if leveraged properly, they can fuel rapid growth. These developments include the expansion of the health care industry, the large-scale experiments at the Sanford Underground Research Facility, and the move to locate the B-21 Raider at Ellsworth Air Force Base. Any one of these alone would be a significant economic development in a community the size of Rapid City. The fact that we have three of these “game changers” all happening at once is incredible.

Lastly, SD Mines has an entrepreneurial innovation ecosystem that is thriving. The number of startups launched here has increased dramatically over the last decade, and the infrastructure to support these businesses has matured. Companies such as VRC Metal Systems, Trion, and Nanopareil are perfect examples of faculty startups seeing success. Students have joined the ranks of the entrepreneurial community and programs such as the CEO Student Business Plan Competition and the Braun Student Inventor Award serve to foster these types of activities on campus.

The scale of our expansion depends on the community’s ability to foster and support such growth. I am pleased to see so many champions of this effort here. Because we are working together in a concerted and visionary way, I believe the Black Hills area is at the beginning of a technology-based economic boom.

# COME HOME HARDROCKERS!

The 5-year reunion is

**Wednesday, July 8 to Sunday, July 12, 2020**

Many events are being planned!

Presidents' Welcome – Pub Crawl – Tunnel Activities – Economic Development Panel Discussion – Golf Classic – Banquet and Dance – Summer Nights – Athletic and Campus Open Houses – Black Hills and Badlands Recreational Opportunities – and More!



# ENGINEERING IN THE SKY

Mines alumnus leads redesign of  
Space Needle's revolving glass floor

The first time **Wade Morris (ME 97)** was working on the newly installed revolving glass floor of the Seattle Space Needle he was caught off guard. Morris was preparing a test run of the mechanism that makes the floor turn and he stepped backwards off an opaque section onto the clear glass. He didn't realize he was standing on what appeared to be 500 feet of thin air, until he looked down. "My arms flailed for a moment before I realized I was not stepping off a cliff," he laughs.

Morris is not typically afraid of heights, but the view from what is called "The Loupe" takes a bit of getting used to. "Now that I've spent more time up there, I am perfectly comfortable on the glass," he says. "However, now I take pleasure in watching the other tourists' first experiences as they step out onto the glass for the first time. From kids to little old ladies to big strong men, everybody has a unique way of reaching past the fear of having nothing but glass beneath their feet."

Morris is an automation mechanical engineer with the company Fives Lund. He was the project manager for the design, build, and install of what's marketed as "the world's first and only revolving glass floor." His work is part of "The Century Project," which is the on-going renovation of the Space Needle.

Dangling fifty stories in the air on a glass floor is unsettling, but not unsafe. This is thanks to the work of engineers like Morris. The renovation of the Space Needle includes a huge number of upgrades that bring the building into compliance with modern codes that have evolved since its construction in 1962. Finding the right building code to use in this project was one of the challenges Morris and his team faced in the design phase. "They don't have a spec or standard written for revolving glass floors," he notes. He worked

alongside a structural engineer and found codes used in amusement parks to help inform the design. The project also had to meet strict seismic codes required for all buildings in Seattle. Morris and his team designed everything associated with the revolving floor: the rack-and-pinion drive mechanisms, contact rollers, support mechanisms, and the steel frame that supports the glass panels themselves. "When I graduated, I figured my engineering life would be rather mundane," Morris laughs. "I never had any suspicion I would be working on projects as intricate, technologically advanced, or as high profile as the Space Needle."

For most his career Morris has worked on industrial applications, mainly for Boeing. He designs and builds large machines

made for factory floors that are normally only seen by employees and other engineers. This project is directly in the public eye. The drive mechanism for the revolving floor is visible through the glass. Patrons who look down not only see the amazing views of Seattle, they also see the engineering of Morris and his team. "It's been a fantastic opportunity for me to encourage my daughters to explore STEM activities," says Morris. Maybe his daughters will someday call themselves Hardrockers. Regardless, there is little doubt that the work of Wade Morris will inspire future generations of engineers for years to come.







# BUILD IT — AND — THEY WILL COME

The rise of Ascent Innovation



Growth in a tech-sector economy is impossible without one essential ingredient: human capital. For decades, many scientists and engineers trained at SD Mines left the area for employment in other parts of the country and world. Today, this is changing. The new Ascent Innovation Campus is a cornerstone in the effort to grow a vibrant, tech-based economy in the Black Hills.

Ascent Innovation is an expanding entrepreneur-centered ecosystem that connects innovators and fledgling business owners with the essential ingredients needed at each stage of business development. It's a talent pipeline connecting students with jobs in industry while providing a landing spot in the Black Hills area for established companies. Under the newly formed Elevate Rapid City, Ascent Innovation is a key part of realizing exponential growth in the Black Hills tech economy.

## Entrepreneur Centered

Entrepreneurs have different needs at different stages of business development. For example, an enterprising student or professor at Mines who has a brilliant idea but has never started a business has a very different set of needs than a Mines alumnus who is operating a successful high-tech startup and needs access to capital and an affordable space to expand operations. By supporting the needs of a wide range of entrepreneurs, Ascent Innovation is fostering the development of the high-tech economy in the Black Hills.

The Mines student with a brilliant idea can take part in university-sponsored business plan competitions, picking up valuable skills and even some prize money along the way. This student can also apply for the annual Braun Inventor Award for a chance to win \$5,000 and a free patent application. Students, professors, and seasoned alumni can tap into a wide range of expertise in the Mines' Entrepreneurs-in-Residence program for consulting, business planning,

and valuable advice from those who've done it all before. The campus office of economic development can also help with access to angel investors and connections to networks of successful companies in the area and across the nation. The resources under Elevate Rapid City, including the Rapid City Chamber of Commerce and Economic Growth Division, in addition to the West River Business Services Center, the Black Hills Angel Fund and other business support services, are all working together to support the expansion of tech-based economy in the area. The model is working. Companies such as VRC Metal Systems and Property Meld are graduating from Ascent Innovation and in the process of renovating new spaces in the community. Meanwhile, a group of promising new companies are waiting to move into the new Ascent Innovation Campus.

## A Hub of Talent

Located halfway between Mines and Rapid City's Main Street Square, the new Ascent Innovation Campus will be placed to connect Mines with historic downtown. The building will also house South Dakota-based businesses that source Mines students as interns (see more in the article Building Talent Pipelines on pages 20-21). This model has proven effective in luring business expansion to the Black Hills. Caterpillar opened shop in the Ascent Innovation Center on the Mines Campus and employed a stream of Mines interns. In 2010, the company opened a new engineering design center in Rapid City that brought about one hundred jobs to the community.

"Our mission to support growing highly-skilled tech-centered jobs in Rapid City is at the core of everything we do," says Terri Haverly, Ascent Innovation Executive Director. "And the more these startup companies and branching corporations are supported, the more our economy continues to grow as well."

## The Perfect Storm

The Black Hills area is witnessing major developments that are helping fuel a tech-sector boom: The expansion of the healthcare industry, including a new Regional Health Orthopedics and Specialty Hospital and other medical and pharmaceutical-related businesses; the continued expansion of the Sanford Underground Research Facility (SURF) in Lead, including the billion-dollar investment in the Deep Underground Neutrino Experiment (DUNE) coming online in the 2020s; and the locating of B-21 bombers at Ellsworth Air Force Base and the industry tied to this expanded mission. "The fact that we have three of these 'game changers' all happening at once is incredible," says Joseph Wright, Vice President of the Office of Research and Economic Development at SD Mines.

A boom in the technology economy in the Black Hills could be viewed as disruptive growth—a change that shatters the status quo. But this would be a misunderstanding. The bedrock industries in South Dakota, agriculture and tourism, will only see benefits from the injection of high-tech jobs into this economy. Visitors to the Black Hills will see new buildings and a vibrant thriving community. Innovation centered around Mines has the potential to benefit the agriculture industry, from self-driving tractors to the expansion of value-added products such as research on turning corn stalks into biodegradable plastic.

The creation of the Ascent Innovation Campus is thanks to cooperative support for tech development in the Black Hills from university, business, and political leaders. "This new development is likely to spark economic growth in an area that has the potential to be a leader in technology manufacturing because of its proximity to the renowned South Dakota School of Mines & Technology," says US Senator John Thune.

# On the Shoulders of GIANTS

Wisdom from the founders of Daktronics and RPM & Associates



The population of South Dakota School of Mines & Technology alumni is full of pioneering entrepreneurs who have changed the regional, national, and global landscape with their grit, hard work, and innovation. As we look forward to a new tech-based economy centered around Mines, it makes sense to look back at some of the high-tech businesses that were started in years past. In this article, we interviewed two alumni who made a difference by creating legacy technology companies that are thriving today. Together they have provided high-paying jobs to hundreds of people and changed the perception of what can be accomplished in a small state such as South Dakota.

We asked the question:

**What advice would you give to a young Mines student or graduate who has a great idea to start a company?**





## Dr. Al Kurtenbach

*Daktronics Co-Founder*

Today, Daktronics is the world leader in the electronic display industry. But in the late 1960s, company founder **Al Kurtenbach (EE 61)**, PhD, and his partner **Duane Sander (EE 60)**, PhD, were working on electronic thermometers, not scoreboards. The partners saw promise in the biomedical device field. But they soon changed direction. "When we adequately thought through the time and resources needed to achieve FDA approval, we decided to change gears," says Kurtenbach. "That's how we ended up getting into scoreboards."

The early success of Daktronics highlights the importance of the flexibility needed to meet the demands of the marketplace. "We learned we could put our scoreboard

beside a wrestling mat and people would approve. It didn't need to be a polished product to instill confidence early on, but it needed a consistent presentation," says Kurtenbach.

"Instead of trying to conjure up a product first, the key is to get to know a market," he adds. "It's important to use the problem-solving skills that engineers are taught to make sure there is a need in society that you have the resources to fill."

Kurtenbach adds that finding the right team to start a business is also vital. "A group of two or three is the sweet spot. Four is too many, but one person is kind of lonely," he says. "Ideally each team member can bring complementary talents and an equal amount of enthusiasm."

But Kurtenbach also warns that engineer-

entrepreneurs can stumble if they fall prey to arrogance. "Engineers need to have a healthy respect for the other areas required for a successful business such as marketing, distribution, and finance. When they put their team together, they need to hold those other folks in equally high regard," he says.

The team Kurtenbach and Sander formed following the founding of Daktronics in

1968 has proven highly successful.

Fifty-one years later, Daktronics' electronic scoreboards, programmable

display systems, and large video displays can be found everywhere from the largest stadiums on the planet down to your local elementary school gymnasium.

**Instead of trying to conjure up a product first, the key is to get to know a market.**



## Rob Mudge

*RPM & Associates Inc. Founder*

It's the love of the Black Hills and of his family that spurred

**Rob Mudge (MetE 76 and MS MetE 78)** to start his own company in Rapid City. "I was complaining to my father. He wasn't very sympathetic. He said, 'quit complaining and start your own business.'" In 1982, Mudge took his father's advice and with the matching financial support of his parents and the help of his wife, Deb, the family founded RPM & Associates, Inc.

In the initial years, Mudge ran the business out of his own home. "Thirty-eight years ago the world headquarters of RPM & Associates was a card table, folding chairs, a manual typewriter, and incandescent

lights with a string hanging down in my basement."

For Mudge, success in business requires commitment, sacrifice, a lot of hard work, and a little luck. "Then you have to realize that you can't do it all yourself," Mudge adds. "If you think you can do it all, you won't go very far. Find some mentors who will offer different perspectives and surround yourself with experts you need."

**'The best is barely good enough' and this is something we still embrace today.**

Mudge says customer service requires integrity. "People say it's hard to get a new customer. Now try and keep one happy for 35 years.

That's much tougher than getting a new one. But if you can do that you can grow your customer base and your company grows. Keep your integrity, that means doing the right thing even when no one is watching and doing it right every time. People will eventually start to notice, and they will come back."

Success as an entrepreneur also requires producing a consistently high-quality product. "My father used to say, 'The best is barely good enough' and this is something we still embrace today," Mudge says.

RPM & Associates has often been recognized as the best. The RPM family of companies now includes RPM & Associates, Inc., RPM Solutions, Inc., and RPM Innovations, Inc. These businesses are world leaders in manufacturing technology such as laser deposition, with clients that include Boeing, the Department of Defense, power plants, and industrial facilities around the world.

In 2016, half a million hoverboards were recalled after lithium-ion batteries in some of the popular scooters burst into flames.

That same year, Samsung recalled its Galaxy Note 7 when the same type of batteries in some of those devices exploded and burned. The recall cost Samsung more than \$10 billion.

With the US lithium-ion battery market expected to reach \$90 billion by 2025, Alevtina Smirnova, PhD, sees great value in fixing this battery problem.

“The reality is conventional lithium-ion batteries are not safe or reliable,” says Smirnova, an associate professor of chemistry, biology, and electrical and computer engineering at South Dakota School of Mines & Technology.

Conventional lithium-ion batteries contain flammable liquid that can become combustible when heated. Heating usually occurs due to a short circuit inside the battery. The end result in these cases is often fire or explosion.

Smirnova plans to put an end to such explosive possibilities by creating a reliable and safe solid-state battery without the flammable electrolyte.

To make this advancement happen, she is working to establish the Center for Green Solid-State Electric Power Generation and Storage (CEPS) with SD Mines serving as the lead institution.

“Battery technology is the hottest topic now and can be applied everywhere,” Smirnova says.

Once established, CEPS will gather experts, researchers and

industry leaders from varied fields to work together to improve the safety and reliability of batteries by producing solid-state batteries that are non-flammable and can survive a broad temperature range. The batteries will also have unlimited charge/discharge, run longer on a single fast charge, be eco-friendly, and have the ability to be used to support electric power grids, she says.

The solid-state energy storage technology has a wide range of applications, from use in portable and medical devices, by the automotive industry, centralized and decentralized electric grids, military applications, energy security and more.

Smirnova received a \$60,000 planning grant in January 2019 from the National Science Foundation to create an Industry/University Cooperative Research Center (IUCRC) at SD Mines. That “center” will be CEPS. Smirnova will serve as the CEPS director, and Duane Abata, SD Mines professor of mechanical engineering, will serve as the CEPS associate director.

The NSF program to create cooperative research centers launched in 1973 to “develop long-term partnerships among industry, academe and government.” Nationally, there are seventy-three such centers doing research on individual topics in the United States, most located on the East Coast.

Since receiving the planning grant early this year, Smirnova and assistant CEPS director/research scientist Abu Md Numan-Al-Mobin, PhD, or “Numan,” have worked to form partnerships

with industry, national labs, and governmental agencies to meet the criteria for the grant.

Smirnova and Numan have secured four university partnerships for CEPS – SD Mines, South Dakota State University, University of South Dakota, and Northeastern University in Massachusetts. Each university receives \$15,000 of the \$60,000 planning grant. CEPS will be based at Mines, but each university will be considered a project “site” for research.

SD Mines’ research within CEPS will focus on new materials and electrical engineering research & development; SDSU’s on integration with solar; USD’s research area is modeling and medical applications; and NEU’s in-situ/operando mechanisms.

The NSF criteria also requires that centers secure at least three partnerships with companies per university site, each company contributing \$50,000 as a full membership fee. The NSF will match the \$50,000 membership fee for the first three industry partners up to \$600,000 per year.

NSF also encourages centers such as CEPS to partner with national labs.

Smirnova says CEPS will become an intellectual property hub for energy storage, and the location in western South Dakota is intentional. “Its location in the center of the country is a benefit, making it accessible to important industries and capabilities around the country and the world.”

Smirnova says industries from different segments of the economy would benefit from partnerships with CEPS, including battery and auto companies such as Ford, Tesla, and GM; lithium, cobalt and nickel mining companies; wind and solar manufacturers; electric power companies; and companies that use battery storage for medical applications.

Industry partners in CEPS will also benefit by having a seat at the Industry Advisory Board, a vote in the CEPS research and development portfolio, the ability to monitor progress in the development of the technology, involvement in the development and approval of CEPS’ bylaws and the retainment of non-exclusive licenses to develop products. They will also be helping to train students for future employment, supporting

the economic development of South Dakota and supporting sustainable electric power grids.

NSF will evaluate CEPS’ progress during a planning grant meeting in the

fall of 2019. If requirements are in place and CEPS can show it can attract industry members, Smirnova will submit a full grant in December, requesting \$600,000 per year for five years in funding for the project, that will be matched 1:1 by industry.

If approved in September for full funding, CEPS will have 10 to 15 years to become self-sustaining, Smirnova says.



Abu Md Numan-Al-Mobin



SD Mines professor  
receives grant to explore  
creation of solid-state  
battery research center

# Bringing SOLID STATE to the State



# HUMBLE BEGINNINGS

A brief look at RESPEC's remarkable history on its 50th anniversary

---

Common threads are often woven throughout the distinguishing features of successful, high-tech startup companies. Their founders are often young, bright, and driven professionals who are keen on seeing their research and innovation develop in the marketplace. These small companies find a problem and fix it; they find a niche and fill it; and sometimes their efforts create entirely new markets. The founding of RE/SPEC Inc. (RESPEC) is parallel to the stories of many fledgling, high-tech startups of today: it began with friends around a kitchen table who committed their own money, expertise, and energy to the endeavor. The only difference is that RESPEC originated 50 years ago, in tandem with the dawn of the information age.

In the late 1960s, SD Mines was focused more on graduating top-tier engineers and scientists and less on fostering cutting-edge research.

**Paul Gnirk (MinE 59)**, PhD, and other founding members

seized the opportunity to form RESPEC (short for Research Specialties). "There were things we wanted to do that we could not accomplish through the college. So, we set up RESPEC, and we started hiring Mines students, and it grew," says Gnirk. The company enjoyed initial successes in the field of nuclear-waste disposal. Gnirk landed an early contract with Oak Ridge National Laboratory in Tennessee to develop better technology for disposing radioactive waste in deep salt formations. Like almost all startups, RESPEC struggled through some lean times in the early years. "It was hand-to-mouth for several years," says **Earl Hoskins (MinE 56)**, PhD, with a laugh. But RESPEC thrived following its humble

beginnings, "because we employed cutting-edge technology in numerical analysis, laboratory rock testing, and modeling. We did what no one else was doing in a better way than anyone else could," says Gnirk.

Over the years, that growth has included hiring a steady stream of Mines graduates who formed a backbone of the company and were happy to find employment in the Black Hills. "Dr. Gnirk's original vision was to keep graduates from Mines in South Dakota rather than having them go out across the world to find jobs. He thought there was enough capacity of students coming out of Mines that he could start a company," says former CEO and President **Tom Zeller (ME 70)**. Mines graduates provided RESPEC with computer scientists and engineers who could deal with complex data and innovate new hardware and software solutions.





Mines also provided engineers and scientists who thrived across disciplines and could undertake complex problem-solving. “We had to have a laboratory,” says Gnirk. In 1981, the company completed its 1,000-square-foot office and laboratory in the heart of Rapid City’s industrial business park. The combination of rock mechanics experts, state-of-the-art laboratory facilities, and engineering and scientific expertise converged to serve RESPEC’s clients in ways others simply could not match.

Several other key elements marked RESPEC’s early success, including an unwritten policy that allowed RESPEC personnel to employ the soft skills needed for building essential customer relationships. “We didn’t talk to clients about work after five o’clock in the afternoon,” says Gnirk. “So our clients knew if they had a beer with us after work, they would not be pressured with sales. Because of this, we were invited to birthday parties, anniversaries, weddings, and all sorts of events on weekends.” These off-work events with clients allowed Gnirk and others at RESPEC the opportunity to establish and maintain personal relationships and trust, which inevitably led to more contracts.

Like all legacy companies, RESPEC also had to survive challenges, including finding financial backing and support, managing cash flow, creating an industrious workforce, and building a permanent workplace. In 1987, after finally finding a place of relative financial and technical stability, RESPEC faced possibly the most tumultuous event in its history when United States Congress amended the Nuclear Waste Policy Act.

The abrupt move, which terminated all but one study for nuclear-waste disposal, eliminated

nearly 50 percent of RESPEC’s projected income overnight.

Despite this devastating blow, the company remained resolute and nimble and adapted to meeting the needs of an evolving marketplace. Over the next few years, RESPEC took the



talents and skills originally developed in the nuclear-waste disposal field and shifted into the commercial sector. Today, RESPEC operates in three major areas: mining and energy, water and environment, and data and technology. The company serves a global list of clients including Sandia National Laboratories, Microsoft, and the National Park Service.

In 1992, the company began an employee stock ownership plan, giving employees a vested interest in the company’s success. RESPEC now has 300 employees who provide services in 40 states and 26 countries. “It has grown beyond any rational belief at this point,” says Hoskins. RESPEC has expanded its operations alongside the university. Since 2000, the company has hired one hundred SD Mines graduates. In total, RESPEC employs 215 engineers and 40 percent of them hold advanced masters or doctoral degrees. RESPEC also employs ninety technologists that include system architects, database managers, and software engineers.

Despite unimagined growth, the company remains true to its roots—its success is still built on bridging the theoretical with the applied. RESPEC continues to thrive by offering creative solutions to some of the world’s greatest challenges. For example,

RESPEC has led these five major research projects in the last four years: (1) A rock melt borehole sealing system that includes melting rock to make a seal that is less permeable than the original rock, (2) a deep borehole field test that involves scientifically validating drilling technology for a five-mile-deep borehole to explore deep underground waste disposal, (3) real-time hazard recognition using video gage technology to monitor ground movement

and impending hazards in underground mines, (4) a fully autonomous unmanned aerial vehicle solution that uses simultaneous localization and mapping to improve underground drone flight for mine safety, (5) and development of numerical models that can predict borehole breakouts induced by thermal expansion for determining in situ stress.

“We are a humble bunch of engineers, scientists, and technologists,” says **Todd Kenner (CE 83)**, current RESPEC CEO and President. “If you have any kind of knowledge of the business community, 96 percent of businesses don’t survive past ten years. So, we’re in a rare group of companies who have survived for a long time.”

Today, an increasing number of tech-based startups in the Black Hills are trying to recreate what RESPEC pioneered 50 years ago. If the success of RESPEC during the past half-century is any indication, this company will continue to lead the way for the next fifty years.

A man with short brown hair and a light beard is smiling and looking off to the side. He is wearing a dark blue blazer over a white button-down shirt with gold buttons. The background is a scenic view of a forested mountain range under a cloudy sky.

# CONNECTINGDOTS

Ray Hespen brings Property Meld to the Black Hills





“Buy the plot, I’m dying here,” says **Ray Hespen (MineE 09)** when describing his move back to the Black Hills. Like so many who go to school at Mines, Hespen never wanted to leave the area. “You fall in love with this place,” he says. “But the money was elsewhere.” After graduating Hespen bounced around the country in various engineering jobs: Oklahoma, California, Illinois, Maryland, and Colorado. But he never forgot his college years in the Black Hills. “The whole time I was looking for a way to come back, but the opportunities weren’t here,” he says.

### Cutting His Own Path

Hespen’s opportunity came, as many do, in the form of a problem—namely, a bad rental experience. His business partner and co-founder, David Kingman, had issues with a rental he was living in and couldn’t get a property manager to answer his phone calls. “Engineers do really well at starting with a problem and working backwards. So, that’s what I was able to do,” Hespen says. The partners started by talking to twenty-five property management firms to learn their processes. From there, they built the business case to form the company Property Meld. The two men quit six figure salary jobs and put all their resources into the new company. The business they created connects renters with maintenance service providers and property managers in a simple and easy-to-use software program. This allows tenants to get issues addressed quickly and efficiently. “We solved a primary issue many renters have,” says Hespen. The process also saves property owners and managers money. “We’re making it less costly to perform the role of property management. Our service ends up being a significant cost savings for owners and managers,” he adds.

In the early days of the company, Hespen worked out of his own basement while Kingman developed the software. “It was a little terrifying,” he says. “It’s a very complicated problem and no one we could find had done this. That gave us pause.” But Hespen’s education at Mines gave him a unique skill set that helped. “I’ve realized how my engineering degree has

played a role in understanding marketing at scale and sales processes,” he says. The business gained traction and when a space opened at the Ascent Innovation Center on the Mines campus, Hespen brought the company to the Black Hills.

Today, Property Meld is one of the shining success stories in the area. The company has outgrown the incubator and is moving into its own space in downtown Rapid City. The service Property Meld provides is proven in the marketplace. “Getting to watch it grow. Getting to hire a few people every month. Getting to watch the numbers keep going up. I feel very blessed about that for sure.”

### Growing Pains and Future Opportunities

When asked to offer advice to other Mines graduates who would like to come back to the Black Hills, Hespen’s answer is two words. “We’re hiring.” He laughs, but his sentiment reflects one challenge businesses in growing tech economies often face—the need for human capital. Mines and other area schools provide a stream of eager graduates and interns with the strong work ethic. But a challenge remains in finding experienced engineering managers, sales personnel, and other positions necessary for a rapidly growing company. Hespen has found success using LinkedIn to connect with professionals who were educated in the Black Hills. “It’s amazing how much conversation it generates when you dangle a carrot in front of someone and say ‘Hey, you want to come back to the Black Hills?’” Hespen adds, “All my classmates at Mines wanted to stay in the area and there is a demand for quality jobs here.” In this demand, many like Hespen see opportunity. “Things are moving in a very positive direction. I’m legitimately excited for this city. It’s going to be fun,” he says.

If you want to know more or are interested in job openings at Property Meld, check out the company website: [Careers.PropertyMeld.com](https://careers.propertymeld.com).

# HYPER

## Mines alumnus works on cutting-edge transportation

---

“Flying 700 miles per hour through a tube using magnets and sunlight isn’t a dream.”

The baritone narrator in a video describing the proposed Great Lakes Hyperloop makes the case that a twenty-eight minute commute over the 343 miles that separate Cleveland from Chicago is a near-term reality.

For **Chuck Michael (CE 77)**, hyperloop is the future of transportation. “This is a game-changing technology with a huge public benefit,” he says. “You could work in downtown Chicago and live in Cleveland and get to work faster than sitting on the freeway from the Chicago suburbs.”

The hyperloop concept involves a magnetically levitated capsule that is propelled through a vacuum tunnel at velocities approaching the speed of sound using renewable wind and solar energy. Michael is the head of

US feasibility studies and regulatory advisor for the company Hyperloop Transportation Technologies based in Los Angeles.

“We use a proprietary passive magnetic levitation system, developed at Lawrence Livermore National Lab,” Michael says. A small forward motion on the permanent magnetic array creates a field that aids both propulsion and levitation. “We can levitate twenty tons at walking speed,” Michael says. A “reimagined” linear motor, powered by renewable energy, provides electromagnetic propulsion with virtually no emissions. The capsules need very little energy to move in the low-pressure tube where aerodynamic drag is negligible, and friction is eliminated. “You can push it and it will coast for a few miles,” he says.

Much of the hyperloop can be built underground. This saves energy and eliminates the need for dealing with surface easements, road crossings, and changes in topography that can hinder high-speed transportation development.

The company touts 800 collaborators including the world’s leading corporations and universities and more than fifty multidisciplinary teams working across six continents. “There are a lot of people out there who like to tackle difficult technical challenges,” says Michael. “We source top experts in their fields who work in organizations around the world.”

The first commercial hyperloop system is set to go





# HYPERLOOP

on-line in October 2020 in Abu Dhabi. It covers a three-mile span and will be a gateway to Expo 2020. The system may someday connect the cities of Abu Dhabi, Al Ain, and Dubai in a giant triangle offering travel times in minutes rather than hours. Hyperloop projects are also being planned in Asian and European countries—many projects, like one in Germany, have a dual focus on movement of both passengers and products from major sea ports to markets inland.

On this side of the pond, Hyperloop TT is leading a public-private partnership in Ohio, Indiana, and Illinois to evaluate a hyperloop connection between Cleveland and Chicago. Michael says the feasibility study is nearly complete. “There are no existing rules or regulations for this kind of system yet in the United States.” The company is working with various federal agencies to develop the regulatory framework for this and future hyperloop projects. “This

project is an incredible challenge but fun,” he says.

Michael’s lengthy engineering career includes large infrastructure projects from high-speed rail transportation systems to deep underground science lab planning. He came across the idea of the hyperloop while grappling with the significant regulatory and



Chuck Michael (CE 77)

engineering hurdles on a proposed bullet train connection, in Minnesota between Rochester and Minneapolis. “That project led us to a series of questions that needed to be answered by a different technology,” Michael says. In 2013 he read Elon Musk’s whitepaper on the hyperloop and “had some ideas for improvements,”

but he saw merit in the overall concept. He soon began

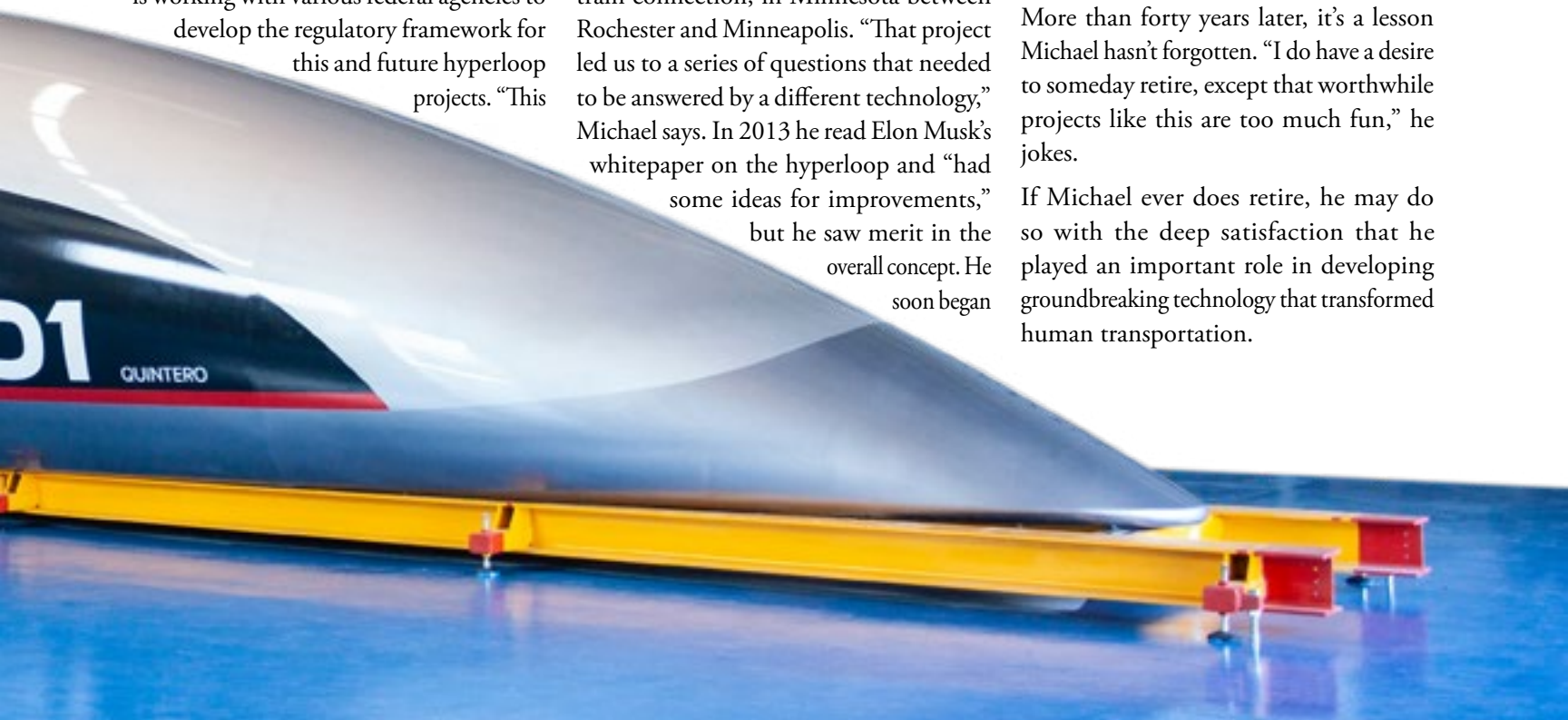
meeting with a group of like-minded individuals and began working on hyperloop feasibility studies in the central valley of California.

“We changed most of the technology in Musk’s paper while streamlining the permitting process with the federal government,” says Michael. “We can build a system that will travel at almost the speed of sound, at a fraction of the cost, that uses solar and wind energy alone.”

Hyperloop TT is now testing its passenger capsule, which is designed to aerospace standards, at a full-scale test track at an old airfield in Toulouse, France. Michael says the skills he picked up as a student in the 1970s at SD Mines are still valuable today. “Professor Bill Coyle taught me to always take the time to do it right, and never stop trying to improve your work after that,” he says.

More than forty years later, it’s a lesson Michael hasn’t forgotten. “I do have a desire to someday retire, except that worthwhile projects like this are too much fun,” he jokes.

If Michael ever does retire, he may do so with the deep satisfaction that he played an important role in developing groundbreaking technology that transformed human transportation.



# Talent Pipelines

## Funneling Mines students into high-tech jobs

The ultimate success of a company is often defined by the level of talent it can attract. For 134 years, Mines has produced highly-trained engineers and scientists. In recent history the university has developed a more symbiotic relationship with the companies in Ascent Innovation that helps funnel talented individuals into industry. This relationship results in a win-win for students and companies. Students get internships they can walk to after class while gaining real-world experience and wages that help offset tuition costs. Employers get a line on hard-working Mines students that they can train and vet before graduation. The list of companies who have undertaken this opportunity is long. Here we profile just a few.



Andrew Pierson (CS 14)



While at Mines **Andrew Pierson (CS 14)** accomplished something that few undergraduate students achieve. His senior design research went on to become a United States patent. While an intern at Raven Industries, Pierson worked to help develop sensors for self-driving tractors that allow them to follow the cut edge of a crop row during harvest.

Raven has an office in the Ascent Innovation center on the Mines campus. Pierson was part of a team of students who worked on the project. “They were all super bright,” says **Jim Slichter (ChE 77)** who leads Raven’s Rapid City office. “They were fun to work with and they were enthusiastic. They had a very positive attitude and never got beat down by the inevitable failures that happen in any product development.”

Pierson accepted a full-time position after graduation and his internship at Raven allowed him to hit the ground running. “It gave me a really good foundation and helped me learn what to expect on the job. I got to try on the glass slipper, so to speak,” says Pierson with a laugh.



Talented Mines students are not only a great resource for established companies, they are also wonderful for startups and new businesses. “Interns allow us to do the more difficult tasks like design work, while they tackle the jobs that require technical skills they picked up at Mines,” says **Ed Mandy (CS 97)**, 7400 Circuits owner.

Mandy and his partner **Andrew Pavak (EE 11)** also build customized circuit boards, engineered control systems, schematic design, prototyping, and consulting services. Their newest intern, Antonio Bano-Sanoguera is an industrial engineering major. “It’s really nice to have a pool of different companies near campus where I can get a job,” he says.

Interns can also bring important skill sets to a small company. “He will help with our process,” says Pavak. “We’re experimenting with more manufacturing in-house. With the tariffs and lack of skill sets there is a need for small contract manufacturing in this area.” 7400 Circuits also operates in the retro video gaming industry, selling their products at freeplaytech.com, which includes kits that allow consumers to program and install video games on DIY handheld devices.

“It’s kind of like the classic car market,” says Mandy. “Some consumers want retro games that are all original and some want mods and the latest hardware.”



Antonio Bano-Sanoguera



The space for established companies in Ascent Innovation also helps keep talent in high paying jobs in Rapid City. “It’s great to stay in the Black Hills, it’s a really nice area,” says **Garret Odegaard (CS 19)**. Odegaard is a software developer for CHR Solutions. He was hired following an internship along with two other Mines graduates this year.

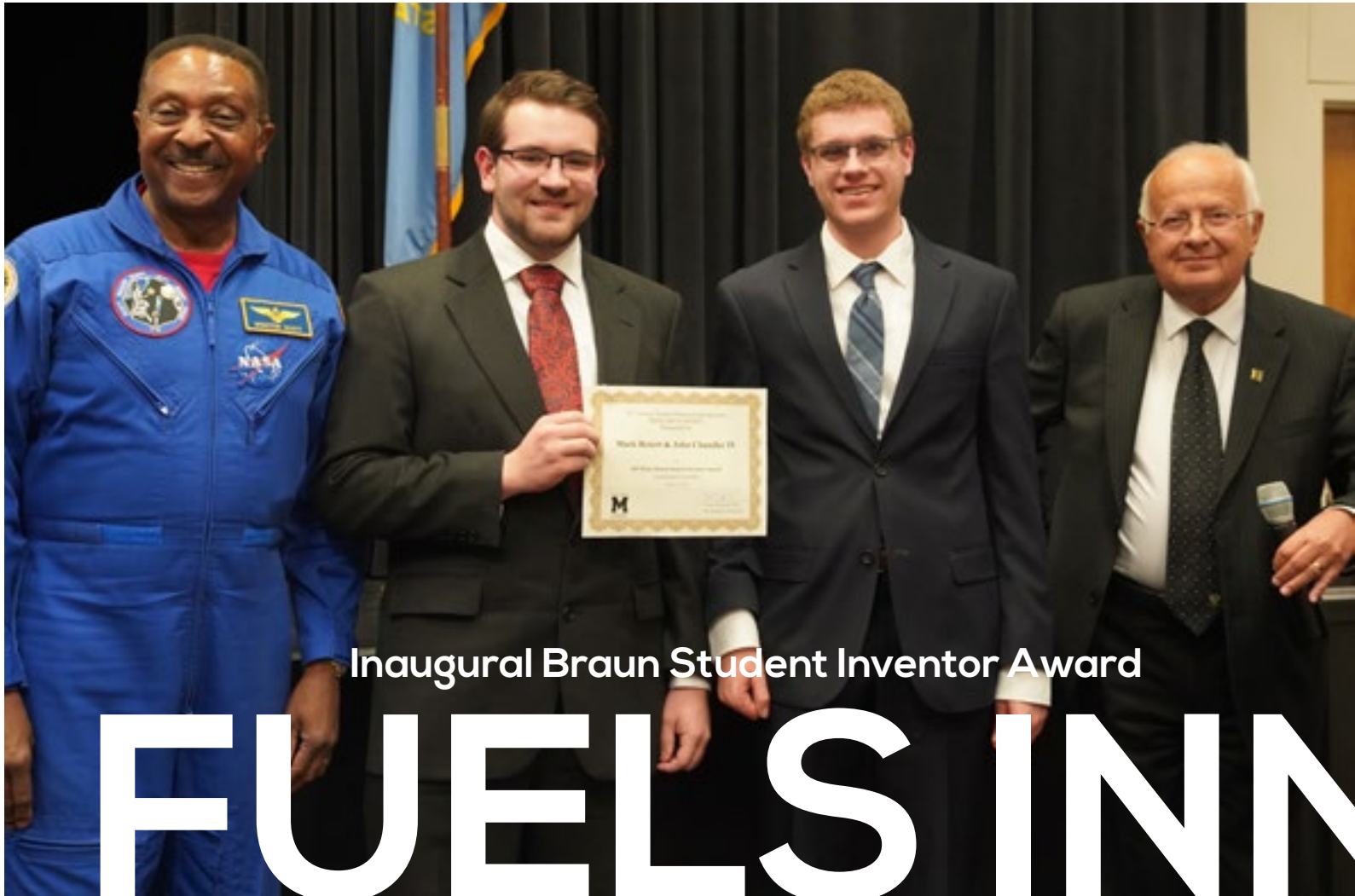
CHR Solutions provides software solutions, engineering, and managed IT services for communications service providers. The company helps clients address operational and marketplace challenges.

For Gary Knee, the location at Ascent Innovation is strategically important for the company. Knee is Head of the Software Solutions Business Unit and the Managed IT Business Unit. “Access to the high-quality talent found in the Dakotas is extremely difficult to get,” he says. “This is a win-win for us.” Knee says the commitment CHR Solutions has had with South Dakota over the decades won’t change anytime soon. The company has offices in Mitchell, Rapid City, and Sioux Falls.



Garret Odegaard (CS 19)

Mark Rotert and John Parker Chandler, IV being presented the Braun Student Inventor Award by astronaut Winston Scott, who attended the award ceremony, and Jan Puszynski, PhD, former vice president of research at Mines.



## Inaugural Braun Student Inventor Award

# FUELS INN

**Dave Braun (ME 61)** has always been an innovator and creative problem solver. As a student in the late 1950s and early 60s he had an idea for a digital recording device that would be cheaper and more efficient than products at that time. He eventually saw his idea developed by others in Europe and many versions are now on the market. Braun also researched new ways to measure the horsepower of small engines. Unfortunately, at that time, there were limited resources on campus for students to turn their ideas into innovations.

After completing his master's degree at

Kansas State in 1967, Braun went to work for 3M. The company is known for pioneering cutting-edge technology and innovation. During his career Braun contributed to multiple patents and ideas that are now in the marketplace.

His experiences shaped his understanding of the importance of creativity in engineering and science. "When you have a very complex problem where there is no straightforward answer, you have to learn to think differently, you need to study all the technical parameters around it, and then step back and give some time to allow your subconscious to

work on it. And then you might have a eureka moment," says Braun.

Now Braun has created an opportunity to help and mentor students who have an innovative spirit. Braun and his wife, Ann, established the Ann and Dave Braun Student Inventor Award to encourage the development of creative skills and new ideas that could become patents. The award includes \$5,000 and a free patent application from Goodhue, Coleman & Owens, P.C.

Through their award, the Brauns also hope to grow the culture of creative thinking,





# NOVATION

problem-solving, and innovation that exists at Mines. The aim is to foster new ideas that can become businesses and fuel continued economic growth centered around the university.

Mark Rotert and John Parker Chandler, IV won the inaugural Braun Student Inventor Award with a vortex generator that reduces drag on cars and semis. The product, called TwisTech, improves gas mileage. TwisTech is now undergoing testing by students and faculty. So far, the team found improvements in fuel efficiency by up to ten percent for cars and seven percent for trucks.

"If TwisTech shows any continuing statistically significant improvement in fuel economy this will be a very important patent," says Braun. "If the gains they have shown to date hold up in further tests then this is a huge breakthrough," he adds.

Rotert and Chandler also won the SD Mines CEO Business Plan Competition and the Governor's Giant Vision Awards. Their company, Tornado Aerodynamic Solutions, LLC, aims to improve fuel economy via aerodynamics on automobiles and trucks with a particular focus on agriculture.

In his retirement, Braun continues to

innovate and create new ideas. He has written a booklet called Student Inventor's Self Help Guide that is available to anyone at Mines. Braun also used knowledge recalled from his time at Mines to recently design a box using miniature rare earth magnets in attraction mode to eliminate the front hasp. The design also uses magnetic repulsion to open the cover automatically once it is pulled open to a point just past the influence of the attraction magnets. The open cover can act as a reminder that something is needed in the box and the partially open cover is easy to open with one hand.

# 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 August 14, 2019, and are listed by year of graduation.*

Roy Fox (CE 43) 3/8/19  
Sylvan Williams (EE 47) 5/13/19  
Warren Bush (EE 49) 4/27/19  
Lowell Plooster (EE 49) 2/22/19  
Jim Buchholz (EE 50) 4/16/19  
Wallace Combellick (ChE 50) 12/16/18  
Art Childers (CE 51) 7/18/19  
C. Robert Sacrison (MinE 51) 12/24/18  
Lewis Connolly (MetE 53) 2/7/19  
Terry Heil (ME 55) 6/27/19  
John Duncan (ChE 56) 8/13/11  
Richard Muchow (ME 56) 5/24/19  
Dorwin Larsen (ME 57) 4/18/19  
Dave Rozendal (CE 58) 12/15/18  
Irving Anderson (EE 59) 9/4/15  
Erwin Brink (EE 59) 10/18/16  
Walter Sutherland (GeolE 60) 3/30/19

Glenn Barber (CE 60) 5/9/19  
John Heacock (EE 63) 1/3/19  
Glen Oveson (EE 63) 2/15/19  
William "Bud" James (CE 64) 11/16/18  
Laurel "Pete" Peterson (CE 64) 2/21/19  
Dennis Lyle (Chem 65) 10/23/18  
Tom Montgomery (EE 67) 6/27/19  
Jyh Chian Wang (MS MetE 67) 6/28/18  
Robert Hall (CE 70) 11/18/18  
Dennis Hammond (ME 70) 1/20/19  
Carol Myers (MS Math 70) 2/14/18  
David Schultz (EE 70) 4/29/19  
Milt Hinsch (MS Chem 71) 11/8/17  
Fang-Song Kuo (MS ChE 71) 7/1/11  
Raymond (Ren) Tseng (CE 71) 1/30/12  
Terry Schultz (ME 72) 5/5/19  
Joseph Kub (CE 74) 7/14/18

Alex Johnson (GeolE 75) 11/18/18  
Navid Fathi (MinE 78) 10/27/14  
Jim Nieland (EE 79) 5/10/19  
Steven Johnson (MinE 81) 2/2/19  
Alan Tabrum (MS Paleo 81) 1/2/17  
Lee Briggs (CE 82) 5/7/16  
James Staley (MinE 84) 5/4/17  
Bill Lawyer (CE 86) 10/24/15  
Aaron Asquith (CE 98) 2/8/19  
Jonathan Zacher (ME 13) 7/15/19

Former Faculty/Staff:  
Donald Gabe (Military Science) 11/9/13  
Jim Mack (Student Union) 8/7/19  
Tom Oliver (EE professor) 3/21/19  
Jack Redden (Geol professor) 5/20/19  
Paul Smith (IAS) 5/10/19

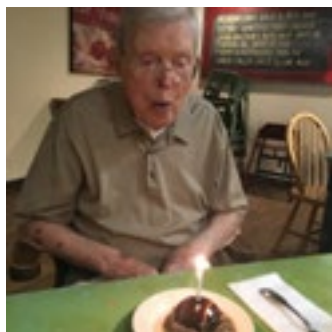
## 50 YEAR GRADS





# CLASS notes

## 1940s —



**Bachy Bachmayer (ChE 40)** is the oldest known living School of Mines alumnus. "Bachy" will celebrate his 103rd birthday in October and lives independently in La Canada Flintridge, CA. According to our database records, there are a total of 6 centenarian alumni. For his 101st birthday (pictured here) he started over with one candle!!



**Richard "Dick" Wiggin (GeolE 49)** is enjoying retirement at Westhills Village in Rapid City after a long career in petroleum exploration around the world. Right after graduation, Dick and his wife, Marie, took their newborn son to Mexico where they spent seven years and had three more children. Mexico was followed by years in Wyoming, Libya, Australia, Texas, Indonesia, Denmark, England, and Kuwait. Thanks to the GI Bill and SDSM&T, Dick got a great education and was able to enter a burgeoning profession that gave him and his family a chance to experience the world and do interesting work.

## 1950s —

**Luther Jungemann (EE 50)** suffered a traumatic brain injury in July 2016 from a fall on his kitchen's marble tile in Osprey, FL. Luther and his wife Joyce moved to Tucson, AZ, to be near their daughter. From a comatose and "not expected" condition, Luther has made a remarkable recovery, but he suffers memory loss and dementia. Still, Luther wears with pride every day the SDSM&T belt buckle he acquired from the campus bookstore during his years at the university. He also wears a recently acquired Mines hat.

**Jack Goth (MetE 50)** "My wife Ree passed away in July 2018. It was a blessing that we had 66 years together. I continue to live at Vi Life Plan Community (also known as a Continuing Care Retirement Community) in Highlands Ranch, CO, and stay active with all the things it has to offer. I plan to be at homecoming next year with my oldest son Jay and possibly

more. I have missed only one homecoming since 1950. That was when we moved to Paris in April of 1985. Best regards to all."

**Al Dougal (CE 50)** retired from the City of Plano after 18 years as manager of the Planning and Engineering Department. "I now reside at a retirement community in western Plano where I have taken up oil painting, including portraits. I was married twice and lost both wives to incurable diseases."



**John Mohr (EE 56)** celebrated his 90th birthday in January with his wife Alice, all of their kids, all of their grandchildren,

other relatives, and a host of friends. "We are fine. Or as I am now prone to say, we are okay age-adjusted!"



**Harlan (ChE 56)** and **Marie Hartman** celebrated their 64th wedding anniversary. "We are healthy and living quietly in The Woodlands, TX. Gave up touring for cruises. Greetings to all classmates."



**Ed Tegland (GeolE 59)**, **Chaman Malhotra (GeolE 59)** and **Landy Stinnett (GeolE 59)** enjoyed dinner together in Denver in October.

**Don Houck (ME 59)** enjoys nice weather in Wimauma, FL, as he remembers winters in South Dakota and Iowa. "My snow shovel is forever nailed to my garage wall now. Three years ago I finally gave up my NNSA Nuclear Clearance after 50 years. Most of my career was at Los Alamos National Laboratories."

**LaVane Dempsey (CE 59)** retired in 1990 after spending 32 years as a geotechnical engineer in the Dams & Special Study Section of the St. Paul District Corps of Engineers. Since retirement, he spends 8 months traveling or in MN and 4 months in Peoria, AZ. "My family is doing great and I had a great career. THANK YOU, SDSM&T."

**Barry Bradshaw (ChE 59)** has been in assisted living care for 3 years and is experiencing decline due to Alzheimer's. His health is relatively good but his memory decline has been a significant problem for him. He resides in a wonderful community and is doing as well as he can. He has loyal visitors from his church and is close enough so his daughter Janelle can see him once a week. He enjoys talking about his life growing up on the Nebraska farm and has told so many great stories about his times at SDSM&T. He remains the same witty, caring, and encouraging man that he has always been.

## 1960s

**Carl Coad (Math 60)** "We are still enjoying retired life in Olathe, KS, and seeing our two daughters and their families. We go to our granddaughter's track meets, where she runs the 800 and 1600 meter races. Our two grandsons in

Omaha are also out for track. We also enjoy watching our granddaughter dance at Irish dance contests. April 23 was our 53rd anniversary."



**David Frerk (ME 61)** joined Boeing 17 days after graduation in June 1961 and retired in 2001 after nearly 40 years with Boeing Commercial Airplanes. "I can truly say that the earth literally shook on the day of my retirement, February 28, 2001, the date of the Nisqually earthquake in Seattle which severely damaged the waterfront viaduct (which now is being replaced with a tunnel)! Since retirement Rosemary and I have traveled a fair bit. Rosemary is still running her own healthcare consulting business and I busy myself with woodworking, gardening, and collecting fine wine. Lately, I have been in touch with some of the brothers from Theta Tau and enjoy the e-mail exchanges. Seems we still have lots in common. This is my first Class Note ever so a big shout out to all of my '61 classmates and a big yahoo to that very special group of guys known to a few as the Rough

Riders who so distinguished themselves on M Hill during M Day festivities on October 22, 1960." Photo taken at the 2015 5-Year reunion. Back row: **Ross Grunwald (Geol 64)**, **Bob Miesen (CE 61)**, and **Harold Schaefer (ME 63)**. Front row: **Mel Steiger (ME 61)**, **David Frerk (ME 61)**, and **Larry Blair (CE 61)**.

**Bruce Orton (ME 61)** has been on the road. "Texas in December with daughter and family. Arizona January-February with son and daughter. Texas March-April. Then on to New Jersey to visit Vicky's youngest sister, my brother in Illinois, and friends from all walks in states as we find them. We are expecting our first great-grandchild in October and plan to arrive home in Dickinson, ND, in time to celebrate the Fourth of July. We are in good health and looking forward to another great year!"

**Don Rinzel (ChE 61)** "A big Arizona howdy to all alumni, especially to the class of '61. I still keep in contact (too seldom) with **Bill Sheldon (CE 61)** and **Bobby Gene Stofft (CE 62)**. Aim to visit the Hills next summer to show two grandsons the campus and that other attraction – Mt. Rushmore."





**Vance Stewart, Jr. (ME 61)**, aka ‘The Geezer’ [3rd from left, Navigator], sent this update: “My daughter, **Kristin Stewart (ME 91)** [2nd from right, Driver] and I finished 3rd overall in our class at the Chihuahua Express 3-day road race in Mexico in my 2005 Saleen Mustang. The Copper Canyon, Mennonite country, and the Chihuahuan Desert were especially beautiful with the desert in full bloom. Only in Mexico can you speed across 1,000 miles of closed mountain roads and not get thrown in jail!”



**Harlan Miller (GeolE 62)** “My man cave display of my green beanie, senior hat, drafting equipment, and of course the old slide rule shows that technology has come a long way in the last 55+ years since my time at SDSM&T. We recently lost our daughter Suzanne (47)

to an autoimmune disease, Catastrophic Antiphospholipid Syndrome, a rare condition with only about 2,000 document cased in the US. Her last three weeks were spent in a clinic in Santa Monica with five specialists and 24-hour nursing care. My wife Betty Lou has some back problems which keeps us close to home.”

**Alfred (EE 63)** and Wilma **Kuehl** attended the 30-year retirement from the Army of son Col. Dale Kuehl at Maxwell AFB, AL, where his last assignment was teaching at the Air Force War College. Dale and his wife Ellen have returned to Huntsville and built a house atop Green Mountain. Ellis is teaching high school math at the school they both graduated from 30 years ago. Dale has started a new career as a financial planner.

**Allan Peterson (Math 63)** “After enjoying 51 years of teaching at the University of Nebraska, I am retiring. During that time I had 34 PhD students, published over 200 journal articles and wrote eight books. Tina and I are looking forward to spending more time with our three children and eight grandchildren. Our son **David Peterson (EE 91)** is a computer programmer working on Zinc-Air batteries.”

**Tex Longcor (EE 64)** “I’m working part-time as a senior

member of the technical staff at Torch Technologies in Huntsville, AL. Theresa and I are looking forward to two trips in the near future - the Snake and Columbia Rivers on the Queen of the West river boat in September and Peru’s Machu Picchu and the Galapagos next February. Although we live in Alabama, we like going north in the summer. We’ll hang out at our Rapid City townhouse and make the rounds visiting friends and family. I hope to become a regular at First Thursday at Thirsty’s.”

**Gene McPherson (EE 68)** “I so enjoyed attending my 50-year graduation two years ago. I now spend winters at the home of my new wife Barbara, who has a home in Punta Gorda, FL, just north of Ft. Myers. Just before Christmas, we departed on a three-month around-the-world journey: West Africa, East Africa, Cape Town, South Africa, Maldives, Sri Lanka, Thailand, Malaysia, Singapore, Manila, Palau, Guam, and Hawaii.”

## 1970s

**Dave Jackson (ME 70)** “I retired from Stantec Consulting Engineers at the end of 2017 and continue to live in the greater Houston area as do both of my children and grandchildren. I enjoy playing golf, traveling, and doing whatever I want. I am happy to not have to deal with

the Houston rush hour traffic on a daily basis. I am looking at the possibility of attending the 50-year class reunion at Mines next year.”

**Daniel Hofer (Phys 70)** spends time playing piano after a 50-year absence, gardening, volunteering, reading, and learning Spanish. “Our youngest daughter and son-in-law are doctors in Honduras at Hospital Loma de Luz. We visit the three grandkids there one or two times a year. Our other daughter is head CPA for non-profit NoonDay Collection, which sells jewelry and other items from third world country artisans. The other son-in-law is co-founder of the internet company Sapling Data. My wife Jane Stansfeld, FAIA, is retired from architecture and now spending time doing creative writing. Her novel on Amazon is *A Sin for a Son*.”

**Howard Hauck (ChE 71)** retired from E.I. Dupont in 2002 and has been enjoying raising about 100 head of momma cows on his hobby ranch in Waverly, TN, since then.

**Ed Schaefer (EE 71)** “I cannot seem to quit working. My KinderCare Education contract ended in December 2018. In March 2019, I started a new contract with Halo Branded Solutions (halo.com). They need an old, broken down Unix

programmer. Halo is located in the Chicago area, but I am still working remotely in Hillsboro, OR.”



Class of 72 college roommates gathered in San Antonio in February on the first anniversary of the passing of **Dennis Schnabel (Phys 72)**. Left to right: **Lance Swanhorst (CE 72)**, **Kurt Haufschild (EE 72)**, **Clyde Ericsson (MetE 72)**, **Cherie Schnabel**, **Dave Cappa (CE 72)**, **Dennis DeWilde (MinE 72)**, and **Neil Quitsch (ME 72)**.



**Stuart (ME 72)** and **Liz Calhoun** are still living in the San Francisco Bay Area, their home since graduation. “The boys are grown and I have been retired for 8 years. We are tired of the congestion here. Thinking about moving back to the Rapid City area. The climate here is

unbeatable, but I think I’m willing to give it up.”

**Bob Heier (ME 73)** “Madonna and I continue to live in Akaska, SD, in the summer and in the New Orleans, LA, area in the winter. We are always busy with rebuilding our old house, volunteering for various organizations, or visiting friends and family. We usually manage to see some of our Triangle brothers and sisters each year. We plan to be at the reunion next year. We would encourage all ‘Miners’ to come and be part of the celebration in 2020. As they say in Louisiana, ‘come and pass a good time.’”

**Paul Ching (MS GeolE 73)** “Barbara and I are enjoying life in Dallas as we have been here 12 years since retiring from Shell in mid-2007. Five of our eight grandchildren live nearby, which keeps us young at heart. I started an oil/gas E&P company with my son and we purchased our first asset in September 2018. We had a most inspiring visit here with **President Jim (EE 78)** and Dr. Wendy Rankin and **Brad Johnson (EE 92)**. Mines continues to be in excellent hands.”

**Larry Messinger (MinE 74)** “Sherry and I decided to make Panama City Beach, FL, our year-round home last year just in time to be greeted by category 5 hurricane Michael. I opened and managed a Red Cross shelter

while Sherry rode out the storm with neighbors. Pretty exciting retirement so far. We’ll be in the Black Hills this summer with our new trailer. Michael destroyed the old one.”



**Susan “Booty” Kuhns (GeolE 75)** hosted her Mines friends last spring in Pittsburgh for their biennial mini reunion. Itinerary included Frank Lloyd Wright’s Falling Water, Flight 93 Memorial, and the Andy Warhol Museum. A great time was had by all. Pictured: back row- **Linda (ChemE 75)** and **Scott Rausch (EE 75)**; Booty; **Anita Freeman (EE 76)**; **Carmen Adams (ChemE 75)**. Front: **Mary Kennon (Ex 75)**; **Susie Jorgensen (CE 76)**

**James Brownrigg (MetE 76)** is 72 years young and is retired at his two-acre bungalow in Hawthorne, FL. James and his wife Betsy have adopted two children in the last five years. Their son is 5 and their daughter is 3.

**Joe Peanasky (ME 77)** “I retired from Cargill in 2018 after 40.5 years. Renee and I are living in

Guntersville, AL, and are doing some US traveling as well as seeing daughter/husband and two granddaughters in Florence, Italy, and daughter/husband and grandson in Philadelphia.”



**Dave Thompson (EE 78)** [Macungie, PA] met **Brad Richardson (EE 00)** [Windsor, CO] while they were working on the same project at Intel’s facility in Guadalajara, Mexico. Their common connecting point was **Randy Zwetzig (EE 78)** [Fort Collins, CO]. It’s a small world.

**Brian Hardy (MS ME 78)** lives in Sioux Falls and has retired. “My wife Robin Prunty and I have five children and 10 grandchildren. Time spent with them is very rewarding. I play Contract Bridge and golf, fish, and hunt. A bucket list moose hunting trip is scheduled for this fall in Ontario, Canada. I truly enjoyed my time at SDSM&T and have recommended it to my family. So far, one brother, one niece and three nephews have attended this wonderful school!”





**Kevin (ChE 79)** and **Carol Alishouse** retired (calling it a “sabbatical”) last May and still live in Madison Lake, MN. They are in good health and spend time visiting grandkids. A lifetime goal was reached last summer when they finished restoration of his college car just in time for the international car meet they hosted. They still see **Doug Owens (MetE 77)** on occasion in Waseca.

**Mark (ChE 79)** and **Melanie (CE 79) [Kogel] Fiegen** have moved from the Twin Cities to just outside of Hill City, joining what seems to be a steady stream of alumni returning to the Black Hills. Mark retired after a 39-year-career with 3M. Melanie transferred to the Rapid City branch of American Engineering Testing and is working part-time.

## 1980s



Back: **Stephanie [Dailey] Lane (ChE 80)**, **Dana Mellage (CE 12)**, and **Karla Fossoy (ChE 79)**. Front: **Terri Meyer-Sipe (GeolE 82)**, **Madisen [Lane] Mellage (CE 12)**, **Austyn Grace Mellage (CE 41)**, and **Cate Meyer (EE 79)**. Family and college friends enjoyed Easter together in Colorado.



**Mike Fredrich (EE 80)** celebrated his retirement with family on June 3, 2019. In front: Molly and Brooke Fredrich. In back: Jason Fredrich, **Scott Fredrich (EE 10)**, Preston and Amy Thomas, Stacie Fredrich, **Mike (EE 80)** and Deb **Fredrich**, and Steve and Collins Thomas.



**Corinne and Rob (CE 81) Sorge and Dave (ChE 81) and Lori (CE 81) Litzen** “We biked in the Marlborough region of New Zealand and celebrated Dave’s 60th birthday on Lady Elliott Island, Australia. We didn’t see any koala bears but we saw some amazing scenery.”

**Steve Hansen (ChE 81)** “I took the official leap into retirement on March 1 after 37+ years at Shell with the last 17 being the environmental affairs manager at the Shell Deer Park site. It was a wonderful ride, but it’s time for some new adventures. My wife **Rita (ChE 81) [Michael]** and I are looking forward to getting all the time behind a camera lens that I can, traveling, and spending some extended time back in the Black Hills.”

**Georg Storaker (ME 81)** “After a long and very good career with ConocoPhillips, I have retired in Texas. Katrina, from Freeman, SD, and I enjoy our lives, and do a lot of things we were unable to do when actively working. Living in a country club, golf, and gardening are favorites. We also have a summer home in Norway and go there when

we want to. Our oldest son is working with Halliburton in Norway following postings in Holland and Germany. The youngest is a senior at University of Houston.”

**Larry Haug (EE 81)** reported that his wife Bonnie passed away unexpectedly in 2014. She was 52.

**Michael Manke (MinE 81)** accumulated a fairly significant collection of all kinds of old original and copied Black Hills minerals maps and reports, etc., during his decades-long mining career in the Hills. “My travels have taken me far away from the Hills these days, likely for the rest of my life, so I think the best place for this stuff to end up is with the old alma mater.”

**Don (CS 82)** and **Becky Martini** have three children and five grandchildren. Don started his career with Sperry Computer systems in Salt Lake City, UT, and has spent most of his time since 1992 supporting RFID systems in Georgia. Don’s father, **Don Martini (CE 80)** passed away in 2012 after enjoying a rewarding career at Boeing.

**Michael Angell (Chem 82)** has 37 years of manufacturing experience in chemicals, polymers, pharmaceuticals, Six Sigma Black Belt, Six Sigma Lean Champion, and 20+ years of LEAN experience with Dow, Allied Signal, Pfizer, Merck, and SunChemical.



**Joel Jarding (ME 82), Tod Torgerson (MinE 83) and Jerry Jarding (ME 74)** attended the Clemson vs. Notre Dame football game at the Cotton Bowl in Dallas, TX, on December 29, 2018.

**Tod Torgerson (MinE 83)** “Debbie and I have been living in the Oklahoma City area for the last 11 years after several moves internationally with Baker Hughes. I recently hit my 35-year work anniversary. Our oldest (daughter Karlee) will be graduating as a PA this year from the University of Oklahoma Health Sciences Center. Our son **Logan Torgerson (EE18)** graduated from SD Mines last May, so we welcome him into the alumni family! Debbie and I look forward to spending more time in the Black Hills in the future when retirement hits!”



**Mike Harris (CSc 83)** is pictured in front of a small portion of Summit, the world's #1 Supercomputer. “I was honored to help IBM

deliver Summit to Oak Ridge National Labs and Sierra to Lawrence Livermore National Labs. They are the #1 and #2 Supercomputers in the world by a wide margin, proudly re-taking the top spots back from China.”

**Eric Jones (GeolE 83)** retired in 2017 from BLM in Moab, UT, where he has lived for the past 30 years. He is now playing music full time in several bands.

**Tom Henderson (CSc 85)** “I retired in 2017 after 30+ years in technology that moved me around the US a bit and also included six years abroad. My last company was Cisco where I spent 17+ years and was a senior director in multiple business areas.”

**Bobbi Wesche-Dunfee (Math 85)**, senior consultant for Leidos Health, has been a ‘road warrior’ for the past eight years, traveling to seven states to implement software in healthcare systems.

**Will Murray (EE 85)** “My oldest daughter is working as an HR manager with a human resource firm. Her twin sister is a project manager for the corporate office of a major retail company. My son graduates with a computer science degree soon, and my youngest daughter has started college. I am looking forward to fishing season in the Hills and Rockies.”

**Ray Wuolo (MS GeolE 86)**

“After countless years of boys underfoot, three of my four sons graduated in May - two with engineering degrees from Minnesota and one from high school. It will be a much quieter (and lonelier) Twin Cities home as son #3 leaves in June for active duty as a midshipman at the US Naval Academy.”

**Jay Bryngelson (ME 87)** “I worked at large nuclear sites until I switched career paths in 1994. I took an early retirement from engineering and decided to change my career to a more human side of things with nursing. Now I am a nurse anesthesiologist, also known as a CRNA. I certainly try to apply a lot of the critical thinking and principles of evaluation and problem-solving I learned in engineering training in my daily work in anesthesia, though.”



**David (CSc 89) and Nancy (Math 88) Frager** reconnected with college friends Dana and **Rich (CSc 88) Schmidt**. Rich writes that he and Dana continue to enjoy retirement after 30 years with Shell. “Our next trip is our annual family trip where we will cruise the Mediterranean with our

incoming daughter-in-law. Dana and I also just hit our 30-year-wedding anniversary, so it is an exciting year for the family. I am looking to continue to give back some time and mentoring beyond our foundation to help give those young ones a kick start I wished I had when I was starting out. We are in the Houston area and always welcome company if old friends are around.”

**Rosanne Bosch (Chem 89), MD,** “I am joining two other pediatricians, three OBGYN physicians, six family practice doctors, an allergist, and even acute care physicians at the new Sanford Clinic on the Tea Ellis Road in Sioux Falls, SD. The facility is amazing.”



**Jackie Sargent (EE 89),** General Manager of Austin Energy, and **Jackie Flowers (CE 92),** General Manager of Tacoma Public Utilities met at the American Public Power Association Conference in Austin, TX, in early June.



# 1990s



## Steve Ericsson (ChE 90)

"I am currently working for Coperion K-Tron in Salina, KS. The company manufactures dry bulk handling and processing equipment. I work as a senior design engineer in the pneumatic conveying division, designing and selling pneumatic conveying systems. My wife Rene and I just returned to Salina after spending seven years abroad. We spent 4 ½ years in our China office living in a "small" city of about 10 million people then worked at our office in Switzerland for 2 ½ years. Our two youngest children lived with us in China, but Rene and I were on our own in Switzerland. We enjoyed our time away and were blessed to be able to travel much of Asia and Europe, but are glad to be back near our friends and family in the States."

**Lance Cutler (ME 90)** is an associate technical fellow for the Boeing Company and a Boeing designated expert in Aerial Refueling. "I have spent 23 years in aerospace and work daily with Tech alumni **Theron Cutler (ME 90)** [my brother],

**Dan Naugle (EE 81)**, **Rod Nelson (ME 84)**, **Carl Beck (ME 83)** [recently retired from Boeing], and occasionally with **Curt Smith (ME 03)**. My ME degree from Tech has served me well for all these years."

**Greg Browne (CE 92)** "I have been in the environmental consulting industry for 30 years, and am currently employed as a project manager (drilling oversight investigations for petroleum and chlorinated solvents) at the Javelin Group, a seven-person firm in Eden Prairie, MN. My first passion is geology and hydrogeology. I also produce response action plans (RAPs) for construction oversight projects for property redevelopment, and for vapor intrusion mitigation systems. Vapor is the big thing in Minnesota right now."



**John Henderson (CE 94)**, Assistant Secretary of the Air Force, hosted Owen Ponto and his parents, Tracy and Alan, on a tour of the Pentagon on May

3. Owen was in Washington, DC, for a ceremony recognizing him as one of South Dakota's top youth volunteers of 2019. The trip was sponsored by the Prudential Spirit of Community Awards. Owen, a 7th grader at St. Thomas More, and the grandson of Jo and **Gregg Owens (Math 69)**, initiated an annual hill-climbing (M-Hill) event, "Climb for a Cure," that has raised \$17,000 so far to help find a cure for Parkinson's disease.

**Steve (ChE 96) and Kelly (IS 92) Olson** live in Houston. Steve has 23 years with Shell and is currently supporting their Deepwater Wells organization. Kelly is a pediatrician and is completing a fellowship in integrative medicine. Their daughter Lizzy is a 7th grader at St. Michael Catholic School.

**Greg Hintgen (EE 99)** "I am super excited for the 2020 all-school, five-year reunion! It is a great opportunity to see alumni and friends."

# 2000s

**Sara [Russell] MacDonald (EE 00)** received her doctorate in electrical engineering from Old Dominion University in Virginia at the spring 2019 commencement.

**George Holland (MS Mgmt 2002)** "I recently retired from the USAF as a Colonel after

25 years. I am now a senior engineer at 2 Circle Consulting, Inc., in Bossier City, LA, and support the B-1 System Program Office in the arena of weapons integration onto the B-1 aircraft."

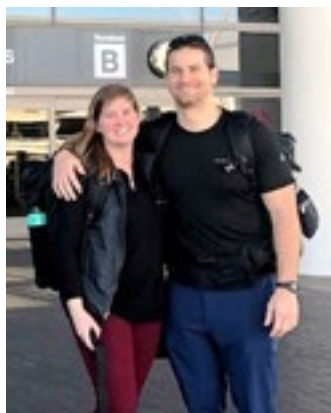
**Billie [Myers] Reinhold (IS 03)** "I used my SDSM&T degree to work as a park ranger in our national parks (Wind Cave, Yellowstone, Carlsbad, and Great Basin). I went back to school after my sister was diagnosed with cancer and earned a second bachelor's degree in nursing. I now work as a registered nurse in the surgery department in Reno, NV."

**Trevor Jebens (ME 05)** is the owner of Jebens Petroleum Engineering established in 2011 to provide expertise to drilling, completion, stimulation, reservoir engineering, and operations with 30 employees and operations in 30 states and eight countries. He is also the owner of Torqmaster, LLC, established in 2018 to provide the energy sector with torque and test operations.



**Adam and Lindsay Schulz (CEng 09)** had their first child, a baby boy named Clayton Adam, on October 24, 2018.

## 2010s



**Jonathan (CE 12) and Megan Tristao** left for a year-long sabbatical in April to travel around the world. Follow their adventure at [www.tristaotravels.com](http://www.tristaotravels.com) and on social media.



**Jade Herman (IS 09)** was named the Graduate Student of the Year by the American Indian Graduate Center in April 2019. In addition to her degree from SD Mines, she holds an MS in administration from the University of South Dakota and is pursuing a doctorate degree in interdisciplinary leadership from Creighton University. She is currently the director of planning and events in the SD Mines Office of the President.



**Casey and Mary Placek (MetE 13)**, Van Dyne, WI, enjoy reading about the lives of other Hardrockers in the Class Notes. Daughter Rowan is almost 2 years old.



**Lindsey Evans (EE 15) and Brandon Westergaard (EE 15)** were married on May 26, 2019, in Rapid City.



**Eric Holmgren (ME 17) and Kelsey Hibl (IE 17)** are engaged to be married on October 5, 2019, in Mason City, IA. The couple works at Emerson Automation Solutions as a test & evaluation engineer and a supplier performance engineer, respectively. The couple resides in Marshalltown, IA.



**Therese Frels (Phys 17) and Jacob Swanson (MetE 17)** will be married on September 28, 2019, in Rapid City. Jacob works at Arconic Aluminum in Davenport, IA, and Therese works at Collins Aerospace in Cedar Rapids, IA.



### We're going digital

Digital publications allow for an engaging experience with a wider audience. Take a look at [engineeringmagazine.co.uk](http://engineeringmagazine.co.uk) to see the quality and ease of sharing articles and more.

Tell us what you think by completing the survey at: [alumni.sdsmt.edu/connect/hardrock-feedback](http://alumni.sdsmt.edu/connect/hardrock-feedback)

Learn more about why digital: [sdsmt.edu/hardrock](http://sdsmt.edu/hardrock)

Or call the Alumni Office at: 605-394-2347





# ALUMNI

## Gatherings



**January 2, 2019** – Twin Cities student/alumni networking event.



**January 12, 2019** – 24th Annual Pierre Area Tailgate.





**February 16, 2019** – Salt Lake City alumni gathering. Back Row: **Sterling Ziegler (MinE 12)**, **Bill (EE 57)** and **Joyce Benda**, **Kelli-Ann Allen**, **Mike Cowen (CSC/Phys 12)**, **Chris Peters (MinE 12)**. Front Row: **Bud Petik (EE 64)**, **Kurt (MinE 78)** and **Norma Kost**, and **Bill Nissen (MetE 57)**.



**March 2, 2019** - Pittsburgh alumni gathering. **Steve Uttecht (EE 92)**, **Tony Fishovitz (EE 80)**, **Suresh Santhanam (MS MTRO 79)**, **Gary Baker (EE 72)**, **Susan Kuhns (GeolE 75)**, **Dennis Poage (EE 67)**, **Sharon Janovy (EE 89)**, and **Susan [Janovy] Burnet (EE 87)**.



**February 26, 2019** – SD Mines alumni at the SME Conference in Denver, CO.



**March 13, 2019** – Washington, DC alumni gathering.





**March 23, 2019** – A group of Triangle Fraternity friends gathered at the Jalapeno Inferno in Scottsdale after a round of golf at Dove Valley Ranch in Cave Creek. From left front: **Bob (CE 72)** and Lani **White**, Jody Rafferty, Jan and **Mark (MinE 80) Lux**, **Steve (CE 76)** and Cindy **Weiland**, their nephew, JJ, and his parents, Melissa and Joe Goeden. From right front: **Jeane (CE 77)** and **John (MinE 77) Hull**, **Dean Rafferty (ME 70)**, **Mark (MinE 74)** and Sharon **Oetken**, Patti Vig, Steve and Cindy's nephew Heath Hagge and his wife, Melynda.



**March 23, 2019** – San Antonio, TX. **Jim (ChE 58)** and Sherry **Adams**, **Clyde Ericsson (MetE 72)**, **Brad Johnson (EE 92)**, **President Jim Rankin (EE 78)**, Dr. Wendy Rankin, **Loren (ME 61)** and Louise **Peters**, **Brogan Pappel (ME 14)**, **Susan Kuhns (GeolE 75)**, **Matthew Grimm (ME 08)**, **Sam Begeman (ME 64)**, and **Jason Luze (IS 10)**.



**March 23, 2019** – Austin alumni gathering.



**March 24, 2019** – Dallas alumni gathering.





March 26, 2019 – Houston alumni gathering.



March 30, 2019 – Kansas City alumni gathering.



April 1, 2019 – Los Alamos, NM. Sitting: Myrna and Jerry (EE 64) Landt, Bill Kass (Chem 63), Gerry Hale (Phys 63), and Tim Taylor (Chem 63). Standing: Jake Gunderson (EE 07), Justin Griffin (ChE 96), Conrad Farnsworth (EE 17), and Brian Glover (EE 04).



April 4, 2019 – Gilbert, AZ. Left table: Joel Grace (MinE 73), Larry Simonson (EE 69), Linda and Jerry (ME 73) Lipovsky, Ray Rossi (ME 64), Bob (CE 73) and Mary Sieger, Patti and Joe (CE 71) Vig, and Steve Allen. Middle table: Katie (CE 03) and Mitch (IE 04) Kruger, Larry (ME 72) and Linda Pearson, Hal Nelson (GenE 58), Maria Cadwallader (IE 96), and Bobbie and Mel (GeolE 58) Glerup. Right table: Ken (ME 81) and Kit Cole, Rodney Jerger (ChE 76), Barb and Jake (ChE 81) Jacobson, Bob Fanning (MinE 77), and Monte Denton (EE 84).





**April 5, 2019** – Tucson, AZ. Seated: **Jim Tarleton (EE 83)**, Rhonda and **Bill (EE 83) Ebert**, **Duane (ChE 66)** and **Linda Huston**, and Shirley and **CJ (ME 60) De Lange**. Standing: **Kreg Beck (GeolE 81)**.



**April 5, 2019** – Tucson, AZ. Front: **Liz Gray** and **AJ Richter (Phys 62)**. Standing: **Bill Sheldon (CE 61)** and **Bob Stofft (CE 62)**.



**April 5, 2019** – Tucson, AZ. Seated: **Jason DeVincentis (Chem 95)** and **Sarah Sydloski**. Standing: **Mike Stanley (EE 86)**, **Jennifer Nelson Kemp (ME 00)**, **Alex (CSc 16)** and **Nicole Muchow**, and **Collin Eddy (EE 15)**.



**April 5, 2019** – Tucson, AZ. Standing: **Shane Lee (MinE 10)**, **Paula** and **John (MinE 80) Alden**, and **Bill Wahl (MetE 74)**. Seated: **Bob (MinE 71)** and **Joanne Gjere** and **Kathy Wahl**.



**April 5, 2019** – Tucson, AZ. Standing: **Susi Rubendall**, **Gordon (EE 81)** and **Mary Strang**, **Chris (EE 89)** and **Beth Smith**, and **David Likness (ChE 62)**. Seated: **Bailey** and **Rube (CE 79) Rubendall**, and **Dan Heintzman (CE 80)**.



**April 7, 2019** – Scottsdale, AZ. Seated: **Susan (GeolE 81)** and **Bruce Law**, **Bob Galbraith (Math 69)** and **Jim Callahan**. Standing: **Dave (CSc 88)** and **Marla Groethe** and **Darcy Anderson (MS MTRO 90)**.





**April 7, 2019** – Scottsdale, AZ. Mines Masters.



**April 8, 2019** – Albuquerque, NM. Ron Banning (EE 81), Vince Humann (ME 68), Larry Blair (CE 61), and Brent Jacobs (EE 86).



**May 3, 2019** – Paul Gnirk (MinE 59) hosted a lunch for classmates who returned for their 60-year graduation. Carolyn [Westre] Trautman (GeolE 88), Charlene, Rose, and Landy (GeolE 59) Stinnett, Veryl (MetE 59) and Kay Eschen, Paul Gnirk (MinE 59), Gene Stienecker (GenE 59), Darlene Ross and Connie Fuchs (ME 59), and Bud Westre (ME 59).



**May 17, 2019** – Hardrockers friends who attended the funeral for Jim Nieland (EE 79). Back Row: Tom Week (CE 73), George Lah (ME 85), Doug Owens (MetE 77), Collin Schaffer (EE 79), Jon Maki (MetE 82), Roger McCambridge (ME 77), Kevin Alishouse (ChE 79). Middle Row: Ken Dolph (ME 79), Julie [Peterson] Bauer (MetE 80), Joni [Lange] Nieland (ChE 82), Tracy [Hall] Bentley (ChE 82), Jan McCambridge. Front Row: Tim Ogdie (ChE 80), Patty [Bryce] Dressler (ChE 83), Joel Nieland (ME 85), and Kevin Lammle (MinE 80).



**May 25, 2019.** Alumni attending the wedding of Kayla and Justin (EE 10) Gaspar: Colby Brakke (ME 11), Larry Simonson (EE 69), James Moisan (ME 07), Ashley Brakke (ChE 11), Scott Fredrich (EE 10), Blake Werning (MetE 09), Tyler Adler (MinE 09), Jesse Morris (CE 11), Corey Coggins (EE 10), Justin Neth (ME 10), Kyle Haar (EE 11), Jeremiah Assman (MinE 11), Sam Voegeli (ME 10), Kelly Hansen (ME 08), and Matt Sudbeck (MinE 09).





**May 30, 2019** - Tacoma, WA. Sitting: Carolyn Perrone and Jean Kotrba. Standing: **Ty Gaub (ChE 84)**, **Jackie Flowers (CE 92)**, **Cliff Alferness (EE 69)**, **Susan Kuhns (GeolE 75)**, **Steve Elrod (EE 81)**, **Donn Lobdell (ME 58)**, **Liz Sailer (IS 93)**, **John Burggraff (ME 58)**, **Janet Quimby**, **Shane Lee (MinE 10)**, **Tim Kuhl (GeolE 75)**, **Dr. Wendy Rankin**, **Doug Kotrba (Math 64)**, **President Jim Rankin (EE 78)**, and **Ron Perrone (CE 70)**.



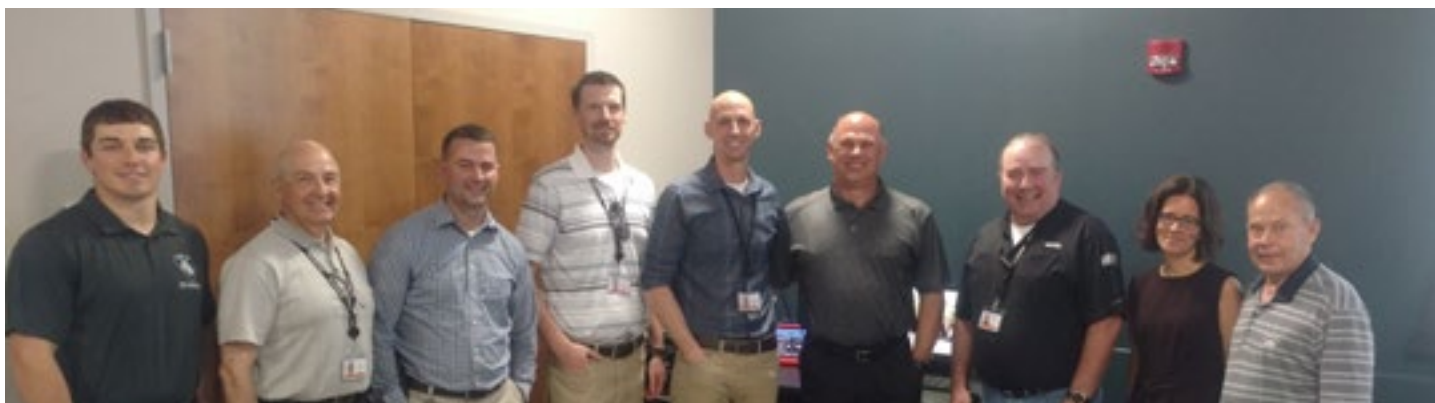
**May 31, 2019** – **Susan Kuhns (GeolE 75)**, **Mark Baracani (MetE 87)**, **Liz Sailer (IS 93)** **Tara Roth (IE 92)**, **Mike Navarro (CSc 94)**, **Shane Lee (MinE 10)**, and **President Jim Rankin (EE 78)**.



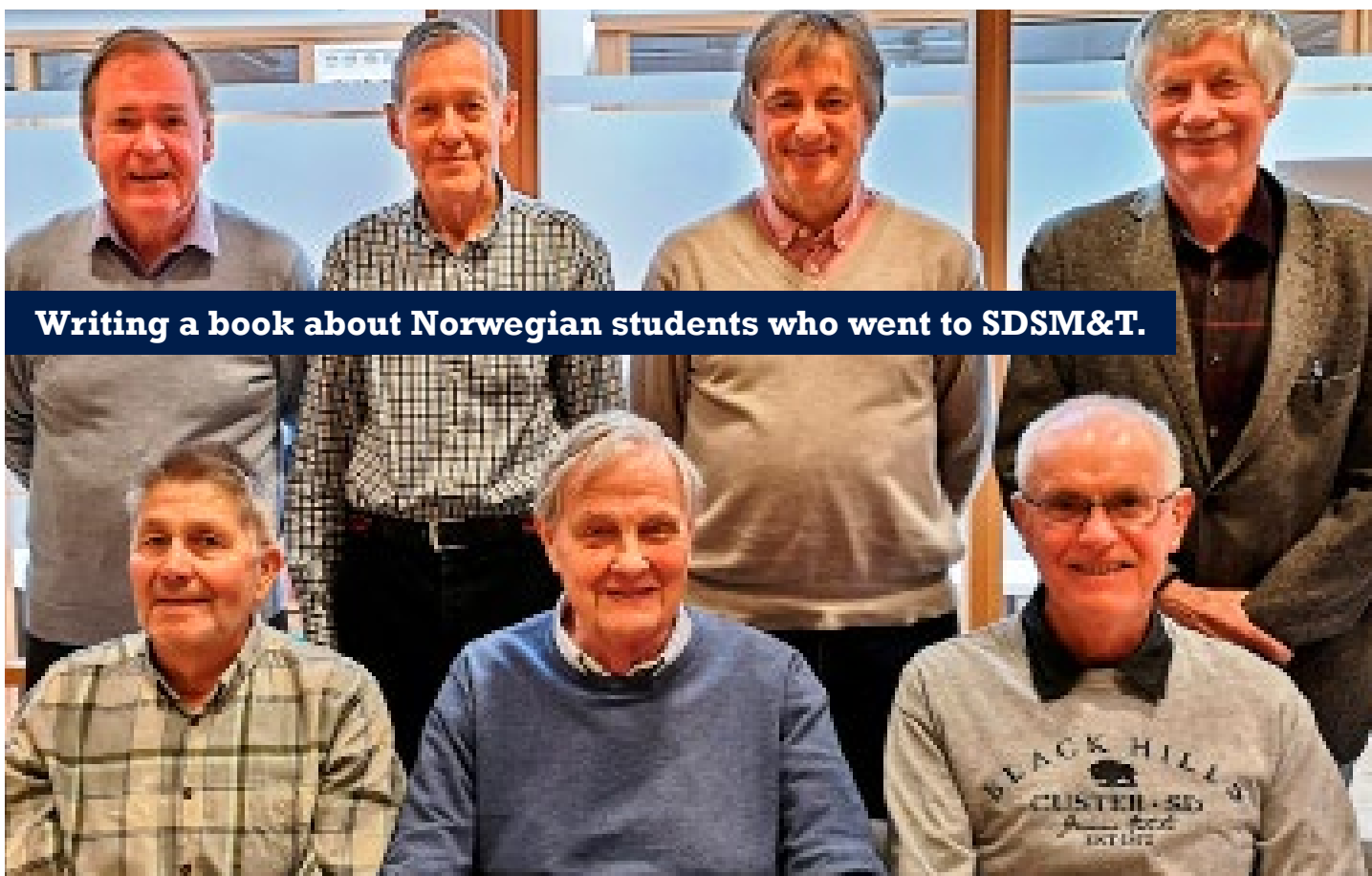
**June 1, 2019** - Seattle alumni gathering at The Golf Club of Newcastle. **Larry Merkle (CE 63)**, **Shane Lee (MinE 10)**, **Marlene Nelson (ME 74)**, **Curt Chenoweth**, **Ram Vedullapalli (ME 91)**, **Tom Corcoran (CE 83)**, **Charley Chambers (ME 69)**, **Jane Corcoran**, **Michael Thompson (Phys 19)**, **President Jim Rankin (EE 78)**, **Steve Olwin (ME 80)**, **Liz Sailer (IS 93)**, **Wes Snaza (ME 08)**, **Savoy Schuler (CSc 18)**, **Yaakov Cohen (EE 16)**, **Roberta Goodnow**, **Julia Abelev**, **Daniel Lipkie (Math 68)**, **Jim (ME 84)** and **Sue (MetE 85) Laurenti**, and **Susan Kuhns (GeolE 75)**.



Find more on our Facebook Page [facebook.com/SDMinesAlumniAssociation/](https://facebook.com/SDMinesAlumniAssociation/)



**June 3, 2019** - Alumni at Mike Frederick's retirement party at Black Hills Energy. **Zane Haase (EE 17), Bob Case (EE 75), Steven Dunn (EE 07), Ron Wilgers (EE 07), Scott (EE 10) and Mike (EE 80) Fredrich, Mark Lux (ME 87), Amy Koenig (ChE 95), and Larry Simonson (EE 69).**



Front Row: **Bjørn Ask (EE 70), Per Kragseth (CE 62), and Hans Nilsen (EE 70).** Back Row: Egil Ertresvaag (professor, University College), **Godtfred Nymark (EE 69), Jo Gjerstad (Editor, Bodoni Publishing), and Nils Mæhle (former director, University College).** From the start of the early fifties, about 800 Norwegian students came to SD Mines in Rapid City to get a higher technical education. Most of these students came from Bergen Technical School (BTS); however, some also came from other Norwegian schools. This is such an important side of the higher Norwegian education system that some of the Norwegian alumni and others have decided to write a book about this cooperation. The book will be named, *The Dream of Rapid*. The editorial committee shown above will among other things, compare the American and Norwegian system for higher technical education and explain why the SD Mines was chosen for the students from Bergen Technical School and other Norwegian schools. They will also give examples of stories of the Norwegian students and describe how they experienced their time at the School of Mines and in Rapid City.



## BY THE NUMBERS:

# ECONOMIC DEVELOPMENT

**\$6,200,000**



Small Business Innovation Research and Small Business Technology Transfer Funding

**\$5,000,000**



Venture Capital Investment

**\$860,000**



Licensing Revenue

**\$100,000**



I-Corps Grants

**\$85,000**



winings at the Governor's Giant Vision Awards

SD Mines generates approximately

**\$238,000,000**

in annual economic impact to SD

**VRG**  
METAL SYSTEM  
ranked in top 500  
Fastest Growing Start-Ups

MINES FACULTY ARE

**3X**

**MORE INVENTIVE**  
than the national average

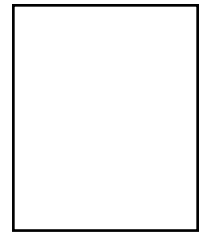


SOUTH DAKOTA



SCHOOL OF MINES  
& TECHNOLOGY

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



# WE'RE GOING DIGITAL

Digital publications provide an engaging experience with a wide audience. Take a look at [engineeringmagazine.co.uk](http://engineeringmagazine.co.uk) to see the quality and ease of sharing articles and more.



Tell us what you think by completing the survey at:  
[alumni.sdsmt.edu/connect/hardrock-feedback](http://alumni.sdsmt.edu/connect/hardrock-feedback)

Learn more about why digital:  
[sdsmt.edu/hardrock](http://sdsmt.edu/hardrock)

