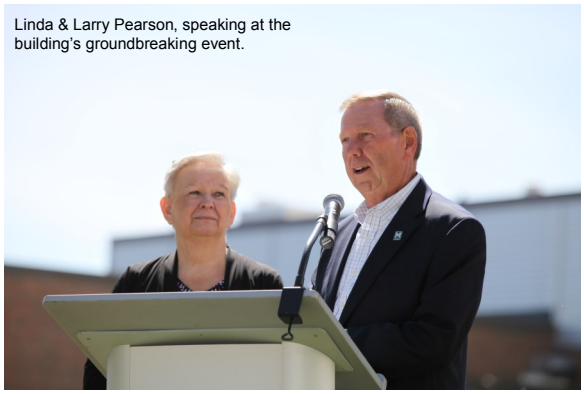
SD Mines Department of Mechanical Engineering

Fall 2018

Pearsons' Donation Helps Fund New Alumni & Conference Center

The SD School of Mines & Technology has received a $3 million donation, the largest gift in school history, from Larry (ME 72) and Linda Pearson for an Alumni and Conference Center to be built adjacent to the campus. Construction has begun with an expected completion date of September 1, 2019.

The Pearsons have been notable supporters of SD Mines and the ME department for years. In 1999, the Pearsons established the Larry & Linda Pearson ERI Scholarship for ME students with a minor in petroleum systems. In 2008, they established the Pearson Professorship (now Pearson Chair) to educate and train engineers and conduct research that supports sound industry development practices; a search is currently underway for this position, which has been vacant since the departure of former Pearson Chair Dr. Umesh Korde in December 2016. Larry Pearson has been a long-serving member of the ME department's industrial advisory board. The Pearsons' support continues to aid the improvement of the university with this most recent donation to the conference center.



Linda & Larry Pearson, speaking at the building's groundbreaking event.

"We are grateful for the immense generosity of Larry and Linda Pearson," said Joel Kincart, SDSM&T Foundation President. "This gift will make a difference for generations to come. It provides a home base for vital collaboration between alumni and students and provides a space where supporters of SD Mines can take part in the positive impact this university has on the community, state, nation and world."

Construction of the Alumni and Conference Center, which will be located on private property west of the Surbeck Center, is funded entirely through private charitable donations.

The Alumni and Conference Center will house the university's Alumni Association on the ground floor and the Foundation on the upper floor. The center will include meeting and conference rooms and a large event area easily accessible for university needs.

ME Faculty and Staff

Dr. Duane Abata
Dr. Jason Ash
Dr. Nickolaus Bruno
Dr. Cassandra Degen
Dr. Prasoon Diwakar
Dr. Hadi Fekrmandi
Mr. Ardell Knudson
Dr. Aaron Lalley
Dr. Pierre Larochelle
Dr. Bamdad Lessani
Ms. Sharayah Martin
Ms. Leslee Moore
Dr. Karim Muci
Dr. Daniel Rederth
Dr. Albert Romkes
Mr. Charles Schilling
Dr. Khosro Shahbazi
Dr. Andrea Surovek

ME Professors Emeritus

Dr. Gregory Buck
Dr. C.W. Chiang
Dr. Daniel Dolan
Dr. Paul Gnirk
Dr. Vojislav Kalanovic
Dr. Lidvin Kjerengtroen
Dr. Wayne Krause
Dr. Michael Langerman
Dr. Richard Pendleton

SOUTH DAKOTA
SCHOOL OF MINES
& TECHNOLOGY

A Letter from the Department Head

This has been an exciting year for the Department of Mechanical Engineering… we've had a flurry of activities and accomplishments. I'll summarize some of our many highlights here. Let's begin with Larry (ME 72) and Linda Pearsons' tremendous generosity to the school to establish the Pearson Alumni & Conference Center as shown on page 1. Our family has grown! We've added five new faculty members and one new staff person this year: Dr. Nickolaus Bruno, Dr. Prasoon Diwakar, Dr. Hadi Fekrmandi, Mrs. Sharayah (Shay) Martin, Dr. Daniel Rederth, and Mr. Ardell Knudson. Prof. Nickolaus M. Bruno (Ph.D., Mechanical Engineering, Texas A&M University) joins us as an assistant professor. Before joining SD Mines, he worked as a process TD engineer for Intel Corporation in Hillsboro, OR. His main research interest is in the thermodynamic behavior of meta-magnetic shape memory alloys (MSMAs). We welcome Prof. Prasoon Diwakar (Ph.D., Mechanical Engineering, University of Florida) as an assistant professor. Before joining SD Mines, he worked as a postdoctoral researcher at Purdue University. His research expertise is in laser-induced plasmas with applications to biomedical and other complex thermodynamic systems. Prof. Hadi Fekrmandi (Ph.D., Mechanical Engineering, Florida International University) joins us as an assistant professor. His areas of research expertise include structural health monitoring, advanced manufacturing and automation, controls and autonomous systems, inspection robotic platforms, sensors, and instrumentation. Currently, his research is focused on design and development of intelligent mechatronics systems; internet of things (IoTs); and big data analysis in engineering, reliability engineering, and biomechatronics. Mrs. Shay Martin recently joined us as a part-time secretary. She brings to the department welcomed and sorely-needed office staff support. In addition, Shay has background experience working in the university admissions office at her prior university of employment. We'll soon be putting those skills to work to help us recruit the best and brightest mechanical engineering Hardrockers! Dr. Dan Rederth (Ph.D., Physics, SD Mines) joins us as a lecturer. Dan's expertise is in Newtonian and solid mechanics. Currently, he's teaching Dynamics, Introduction to Solid Mechanics, and Introduction to Mechanical Engineering courses. Finally, we welcome Mr. Ardell Knudson (MS., Mechanical Engineering, North Dakota State University) as an instructor. His areas of expertise include introductory courses in mechanics and thermodynamics. He comes to SD Mines with a wealth of experience as an instructor at Casper College in Wyoming. Currently, he's teaching Statics and Thermodynamics 1. Mr. Knudson also has expertise in automotive engineering and is developing a new senior elective course for our students.

Our students continue to amaze us with their accomplishments and honors. These range from All American Athlete Justin Barkow to Student Research Award recipient Christina Taylor. You'll find profiles of our outstanding juniors & seniors as well as our Outstanding Recent Graduate Mr. Brandon Lingle (ME 07) of John Deere. In addition, you'll find a summary of all of the new research contracts and grants as well as the archival peer-reviewed publications authored by our faculty and students. Our faculty and students are working side-by-side on topics as diverse as: computational fluid dynamics algorithms to model the multi-phase flow found in microscale biologic systems and examining how best to educate the next generation of mechanical engineers such that they have a solid engineering foundation that is augmented with a systems engineering mindset and skillset. Finally, we conclude with a listing of our recent graduates receiving Ph.D., M.S., and B.S. degrees in the past year. I hope you share in our pride and excitement as you read this edition of our newsletter.

Contact Us

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Faculty and Staff Additions

Nickolaus Bruno (Ph.D., Mechanical Engineering, Texas A&M University, M.S., B.S., Mechanical Engineering, Northern Arizona University) joined SD Mines as an assistant professor of mechanical engineering in January 2018. Prior to joining the Department of Mechanical Engineering, he worked as a process technology development engineer at Intel Corporation in Hillsboro, Oregon. Dr. Bruno enjoys solving complex problems with fundamental principles of engineering and physics. His main research interests include the multi-physical responses and energy couplings in multifunctional and active materials. During his doctoral work at Texas A&M University, he studied the magnetic field- or mechanical stress-driven temperature and entropy changes in shape memory alloys including NiMnIn, NiMnSn, FeMnGa, NiTi, CoMnGe, and others. His current research interests include the design of systems that employ multifunctional materials for energy conversion, such as solid-state refrigeration devices and those for actuation, sensing, energy harvesting, and magnetic memory storage. He is actively seeking undergraduate and graduate researchers who are interested in metallography and materials processing methods including single crystal growth in alloys or elemental solids.

When Dr. Bruno is not working, he is most likely spending time with his children, fishing, homebrewing, or working on “DIY” projects.

Prasoon Diwakar completed his undergraduate studies in mechanical engineering at the Indian Institute of Technology, Kanpur. After completing his undergraduate education, he moved to the University of Florida, Gainesville, for his M.S. and Ph.D. in the ME department under the guidance of Dr. David Hahn. After completing his Ph.D., Dr. Diwakar joined the National Institute for Occupational Safety and Health (NIOSH) as a National Research Council postdoc. Following that, he worked as a research associate at the Center for Materials under Extreme Environment (CMUXE) at Purdue University. Dr. Diwakar joined the ME department at SD Mines in Fall 2018 where he is teaching thermal science courses and conducting research in the field of laser diagnostics, spectroscopy, cold plasma for biomedical applications, and other related research areas.

Besides research, Dr. Diwakar is also passionate about the cause of providing education for underprivileged children and volunteers with various non-profit organizations in supporting the cause of education.

Hadi Fekrmandi joined the Department of Mechanical Engineering in Fall 2017 as an assistant professor. He is a registered professional licensed engineer (PE), and his research expertise include two main areas: (a) bio-inspired autonomous robotic systems and (b) machine learning for intelligent structural and biological health monitoring.

Dr. Fekrmandi previously worked at the Applied Research Center (ARC) at Florida International University where he served as the task lead for technology development for the US Department of Energy’s Office of Environmental Management. He is a member of the American Society of Mechanical Engineers (ASME), International Society of Photonics and Optics (SPIE), Society for Prognostics and Health Management Society (PHM), and Golden Key International Honor Society. He has over 35 journal and conference publications, and he is a reviewer for Elsevier’s *Measurement* journal and the *Robotics and Computer-Aided Manufacturing* journal. Dr. Fekrmandi is coordinating the Advanced Intelligent Mechatronics Systems (AIMS) research laboratory at SD Mines and serves as an advisor for the university’s Moonrockers team for the NASA Robotic Mining Competition.

Faculty and Staff Additions

Ardell Knudson joined the ME department in Fall 2016 as an adjunct instructor before he became a permanent instructor in Fall 2017. Prior to his time at SD Mines, Mr. Knudson taught at Casper College in Casper, WY, for 30 years with a brief interlude teaching in Japan. While at Casper College, he encouraged many of his graduating students to transition to SD Mines, providing support to the university before his permanent status. Mr. Knudson received his B.S. in mechanical engineering in 1977 and his M.S. in mechanical engineering in 1982, both from North Dakota State University. He was working in the petrochemical industry when research activity in alternate fuels increased; this inspired his interest in graduate school.

When not teaching, he focuses his efforts on farm work, classic car and vintage motorcycle restoration and maintenance, and traveling.

Sharayah Martin joined the ME department in August 2018 as a part-time secretary. She grew up a military kid, but while she moved several times, Rapid City has always been considered home. Ms. Martin was born in Rapid City and graduated from Douglas High School. She attended Lee University in Cleveland, TN, where she earned a bachelor's degree in history. She was hired in the Enrollment Office at Lee University as a business analyst, where she was part of the implementation team for a client relation management system. Ms. Martin later held the position of assistant director of admissions, leading the application processing team while maintaining their student databases. She received her MBA during this time, focusing the majority of her interest in organizational management and lean processing.

After having her daughter in 2017, Ms. Martin switched to part-time employment before she and her husband decided to move closer to family in South Dakota.

Daniel Rederth joined the Department of Mechanical Engineering in Spring 2018 as an adjunct instructor. Dr. Rederth became a permanent lecturer for the department in Fall 2018. He attended SD Mines for his B.S. (2007), M.S. (2014), and Ph.D. (2017) degrees from the Department of Physics. After receiving his B.S. degree, he worked as a research assistant in the field of quantum physics, focusing specifically on magnetic quantum dots. Prior to that, Dr. Rederth worked at a Rapid City-based sensor company, MEMSense.

Dr. Rederth's hobbies include hiking, mountain biking, camping, and rock climbing. Additionally, he is the faculty mentor to Outdoor Pursuits, LLC.

ME Student Achievements

Barkow Named to the COSIDA Academic All-American SecondTeam

Mechanical engineering junior Justin Barkow was named to the 2017 College Sports Information Directors of America (CoSIDA) Academic All-American Men's Soccer Second-Team in December 2017. He became the first scholar-athlete in program history to earn the award as well as the first SD Mines student to earn the honor since the institution join the NCAA Division II ranks.

The award gives praise to the nation's top scholar-athletes for their combined performances athletically and in the classroom. With the conclusion of the 2017 season, Barkow holds the school record for most goals in a season (10) and most points in a career (32). Barkow is also the only athlete selected as a 2017 Academic All-American who competes in the Rocky Mountain Athletic Conference.

ME Student Achievements

Taylor Succeeds in Student Research Symposium

April 3, 2018 marked the 9th Annual Student Research Symposium. 93 Mines undergraduate and graduate students participated in this event in the Surbeck Ballroom. Christina Taylor, current senior in the ME department, placed 1st for the Undergraduate Oral Presentation portion of the symposium for her presentation on the sums of powers of positive integers.

Newman Center Student Officers

ME senior Chase Goddard has been selected as the president of the Newman Club on campus. Chase had previously served as secretary for the club before his appointment to his current position. ME senior Kurt Mentele has been assigned as club secretary. Both Chase and Kurt have been active participants in club activities, including retreats and various events.

SD Mines Sponsors CASE Workshop Participants

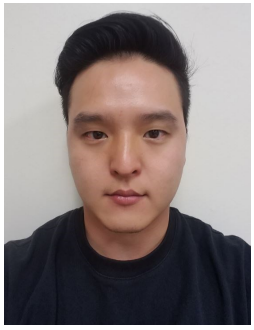
ME Ph.D. candidate Eirik Valseth attended the 2018 Catalyzing and Advocacy in Science and Engineering (CASE) workshop in Washington, DC, on March 18-21. CASE is an entry-level program designed to educate STEM graduate students about science's role in policy-making and the federal policy-making process. Eirik was one of four SD Mines graduate students selected to participate in the workshop with the support of the President and Provost Offices.

Russell Named SA Vice President

Grant Russell has been selected as the 2018-19 Student Association Vice President. Grant, a mechanical engineering junior, is from Hot Springs, SD. In addition to pursuing a degree full-time at SD Mines, Grant is a member of the Hardrocker football team (place kicker and punter), serves as the President of the College Republicans, and is a member of Lambda Chi Alpha.

Grant has put his education to work already by serving as an intern for Lafarge Holcim during the summer of 2017 in Washington, DC, and again during the summer of 2018 at Holly Hill, SC. Grant also attended George Mason University during the summer of 2017 through the Fund for American Studies program and studied economics.

Gwon Awarded Ivanhoe Fellowship



Mechanical engineering M.S. student Yun Seok Gwon has been awarded the 2018-19 Ivanhoe Excellence fellowship. Up to four recipients are eligible to receive this award based on evidence of scholarly excellence. Yun's performance working in Dr. Hadi Fekrmandi's Advanced Intelligent Mechatronics Systems (AIMS) laboratory and his time as a teaching assistant for the ME department identified him as a deserving individual for this award.

ASME E-Fest Activities

Current ME senior Josiah Horner, placed 1st in the ASME Old Guard Poster Competition at the ASME Engineer Festival (E-Fest) West in March 2018. Josiah prepared a poster covering details related to his team's senior capstone design project, "Wright's Shed Company Robotic Shed Transportation." Scoring criteria included ranking of technical content and visual presentation, including creativity, organization, and clarity.

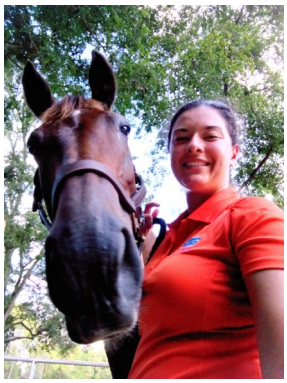
Additionally, other teams represented SD Mines well at E-Fest, including the ASME Student Design Team, the Robotics Team, and the Hardrocker Human Powered Vehicle Team. Besides competitions, students were able to participate in a number of professional development activities.

ME Student Achievements

2017-18 Outstanding ME Juniors

Daniel Boe received the 2017-18 Outstanding ME Junior award. Daniel grew up in the southeast suburbs of Saint Paul in Cottage Grove, MN. He was homeschooled until his junior year of high school when he began attending Inver Hills Community College full time as a dual-enrollment student. Growing up, Daniel never envisioned himself as an engineer; although he had always been fascinated by mathematics, he had little interest in technology, "hands-on" projects, or figuring out "how things work." It was not until he began taking college-level math and science classes that he started to understood the intimate connection between math and engineering. Once he realized how math could be applied to solve the complex problems facing the world today, he was convinced that engineering was the right path to take.

For the past two summers, he has interned at the Intellectual Ventures Laboratory in Bellevue, WA, developing refrigeration systems for off-grid health clinics. These experiences inspired an interest in thermal sciences, particularly with multiphase flow in refrigeration systems; he is currently enrolled in the ME accelerated master's degree program, and, upon graduation in Spring 2019, he will be performing research in this area with Dr. Khosro Shahbazi. His goal is to pursue a career in education; passionate educators played a crucial role in helping him discover a love for engineering, and it is his desire to someday do the same for others.



Christina Taylor was also awarded the 2017-18 Outstanding ME Junior award. Christina was born in Milwaukee, WI, and raised in Kansas City, MO, before her family settled in Rapid City. Growing up, she wanted to pursue a career in art, but, in high school, that aspiration changed to engineering. She started college with a goal for a career in robotics, but her interests soon changed to computer science; eventually mathematics caught her attention. She competed with the SD Mines programming teams in Falls 2015 and 2016, interned at Google in Summers 2016 and 2017, and completed minors in math and computer science.

Christina loves assisting students in their own academic pursuits. She has served as a student mentor for both WiSE and the ME department and as a teaching assistant for CSC 170. She leads the Human Powered Vehicle's senior design team. In Summer 2018, Christina's ME, Math, and CSC backgrounds were put to use as she interned as an undergraduate research assistant at the University of Florida's Center for Compressible Multiphase Turbulence. Outside of school, she enjoys drawing, prototyping, learning new languages (human and programming!), and horseback riding. Currently, she has plans for a project to help horses with heat stroke. After graduating, she hopes to continue her education pursuing a Ph.D. in computational and applied math at Rice University and possibly compete in equestrian sports, specifically show jumping and dressage.

2017-18 Outstanding ME Senior

Matthew Howard received one of three 2017-18 Outstanding ME Senior awards. Matthew is originally from Rapid City. He comes from a family of engineering and mathematics majors, so mechanical engineering was a great fit for him as he began his studies at SD Mines. His involvement on campus has included serving as a peer mentor for incoming freshmen, as well as grading for several classes. Matthew is a member of Tau Beta Pi. He typically spends his summers working in the lawn care business he and his brother started; however, he did spend one summer interning with Balancing Professionals Incorporated (BPI). While the internship was a great experience and he has enjoyed his time studying mechanical engineering, Matthew has come to realize his real passion is in the field of medicine. He is currently interviewing with medical schools with the hope of enrolling in Fall 2019. He is not sure what area of medicine he would like to specialize in, but he does have an interest in orthopedic surgery. He believes bringing the engineering mindset to the field of medicine will provide a dynamic experience for the patient.

Outside of school, Matthew enjoys hiking and dirt-biking in the Black Hills and spending time with family and friends.

ME Student Achievements

2017-18 Outstanding ME Seniors

Austin Kaul received the 2017-18 Outstanding ME Senior award. Austin grew up Springfield, SD, and attended Bon Homme High School. He graduated from SD Mines in Spring 2018 with a B.S. in mechanical engineering. He is currently an ME M.S. student emphasizing in computational mechanics studying and researching under Dr. Albert Romkes. He is a member of the ASME and Tau Beta Pi organizations on campus and is heavily involved with the SD Mines musical arts including Wind Ensemble, Jazz Band, and Pep Band. Austin also serves as a teaching assistant for the ME department grading assignments and proctoring labs for undergraduate students. His current goals are to complete his M.S. degree, write his thesis, and continue with the SD Mines mechanical engineering department as a Ph.D. student.

Frank Marso is the third recipient of the 2017-18 Outstanding ME Senior Award. Frank graduated from SD Mines in May 2018 and currently works at Applied Research Associates in Rapid City as a junior engineer in the Concept Development Group, supporting simulation-based design and dynamic structural analysis. During his senior year, Frank served as the mechanical lead in his senior design team, developing coordinated robots for off-road transport of large loads.

2017-18 Outstanding Recent ME Graduate

Brandon Lingle, the recipient of the 2017-18 Outstanding Recent ME Graduate Award, is a native of South Dakota, born in Yankton but lived in Rapid City for the majority of his life. While at Stevens High School, he enlisted in the South Dakota Army National Guard. After graduating high school in 2002, Brandon enrolled at SD Mines as a mechanical engineering major. He was called to active duty from January 2003 to January 2004, and, upon returning from duty, he resumed his studies at SD Mines.

While at Mines, Brandon was active in ASME, SAE, and the CAMP Mini-Baja team. He held leadership positions in both ASME and SAE, supporting various activities including the annual mechanical engineering hog roast. He was active in Mini-Baja for the duration of his college tenure. Brandon was the co-chair for the Mini-Baja competition that SD Mines first hosted in 2007. He was responsible for organizing and scheduling the competition, as well as overseeing the event's safety procedures.

During his time at Mines, Brandon had 2 internships. The first was with Kiewit Underground in Summer 2006. He was responsible for the design of mechanical structures for underground operations. In Summer 2007, he interned with John Deere at their Construction and Forestry division as a test engineer supporting backhoe engine, cooling, and HVAC testing.

Since graduating in December 2007 with his B.S. in mechanical engineering, Brandon has worked at John Deere in various roles and locations including design and testing/validation; he now supports John Deere in emissions compliance supporting engine certification for global growth.

Brandon is currently enrolled in an MBA program at the Indiana University Kelly School of Business with an expected completion in November 2018.

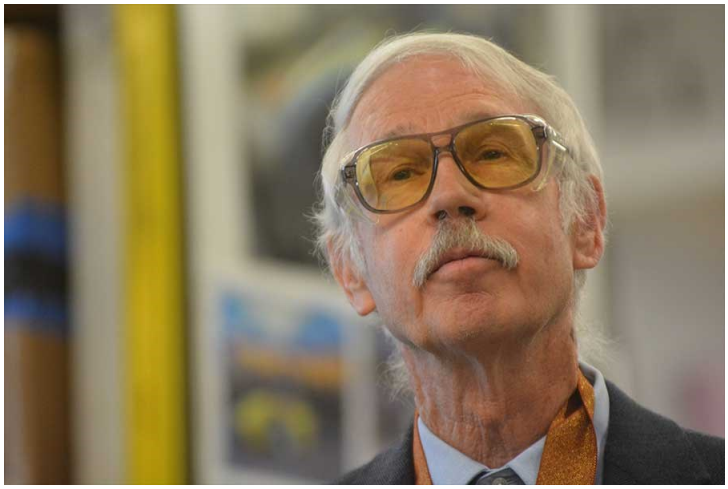
ME Student Highlights

Hillard Brothers PromoteTheir Electric Paramotor

ME students and Rapid City-based brothers Phillip and John Hillard uphold the spirit of innovation and adventure with the design, build, and promotion of their unique electric paramotor. SD Mines has supported the project with laboratory space, tools, and technical advice from both the mechanical and electrical engineering departments. Recently, the students tested the paramotor in Custer State Park and were interviewed by Keloland. To read Keloland's full story, click here. Part of SD Mines' entrepreneurs-in-residence program, the Hillard brothers are scheduled to speak during the November 20th STEAM Café at Hay Camp Brewing Company about their inspiration and experience building and marketing their paramotor.

ME Faculty Highlights

Professor Emeritus Receives the 2017 McDonald Mentor Award



Dan Dolan, professor emeritus of the Department of Mechanical Engineering, received the prestigious national Tau Beta Pi McDonald Mentor Award in Fall 2017, becoming the society's 12th McDonald Mentor since the award was established in 2005. The award celebrates Tau Beta Pi educators for excellence in mentoring. It is presented to one college educator in the United States each year who has consistently supported the personal and professional development of students and colleagues.

The Tau Beta Pi award letter recognizes Dr. Dolan, "for his continued commitment to the education and development of engineering students and for positively impacting thousands of lives through encouragement, guidance, and with passion."

Tau Beta Pi officials write that they were impressed with the broad support Dr. Dolan received in the nomination for this award, stating, "His letter of support from the chapter was signed by nearly 175 students and his letter of support from his department had the signatures of 16 of his faculty and staff colleagues. That is a testament to how many people Dr. Dolan has impacted during his tenure at the South Dakota School of Mines."

Dr. Dolan was presented with a $1,000 cash prize, a $1,000 donation to the Mines Tau Beta Pi chapter in his name, and an engraved medallion on October 13, 2017, at the 112th annual convention in Michigan.

ME Assistant Professor Recognized by the Optical Society

Assistant professor Dr. Prasoon Diwakar was recognized as honorable mention for the Optical Society (OSA) Diversity & Inclusion Advocacy. Dr. Diwakar has promoted a positive diverse and inclusionary environment during his time as a senior postdoc research associate at Purdue University, faculty advisor of the Purdue Society of Applied Spectroscopy, volunteer at the non-profit organization Asha for Education, and inventor-in-residence at the Frost Science Museum in Miami, FL. New to the ME department as of Fall 2018, Dr. Diwakar intends to continue developing diversity and inclusivity on the SD Mines campus.

New Projects in 2017-2018

S-STEM: Culture and Attitude II

- PI's: Mike West (PI), Shaobo Huang (co-PI), Paula Jensen (co-PI), Jon Kellar, **Cassandra Degen**, Jennifer Benning, Andrea Brickey, Kelli McCormick, Lisa Carlson (senior personnel)
- Funding Source: NSF DUE - Strand 2: S-STEM: Design & Dev - Type 1 Single Ins
- Project Period: 01/2017-01/2022
- Budget: $982,625

The role of multi-scale porosity on termite mound behavior

- Faculty: **Dr. Andrea Surovek**
- Funding Source: National Science Foundation
- Project Period: 8/2018 - 8/2021
- Budget: $475K

Environmental Sustainability Program: "Sustainable System for Mineral Beneficiation

- Faculty: PI: Jon Kellar (MET), Co-PIs: William Cross (MET) and **Albert Romkes (ME)**.
- Funding Source: National Science Foundation; Division of Chemical, Bio-Engineering, Environmental and Transport Systems
- Project Period: 07/01/2018-06/30/2021
- Budget: $412,908

Planning Grant: Engineering Research Center for Naturally Inspired Resilient, Sustainable and Adaptable Infrastructure

- Faculty: **Dr. Andrea Surovek**
- Funding Source: National Science Foundation
- Project Period: 9/2018 - 8/2017
- Budget: $410K

Incorporating System Thinking and Systems Engineering Concepts in Undergraduate Engineering Courses

- PIs: **Karim Muci-Kuchler**, Mark Bedillion (Carnegie Mellon University), **Cassandra Degen**, Marsha Lovett (Carnegie Mellon University), Clifford Whitcomb (Naval Postgraduate School)
- Funding Source: FY17 Funding Opportunity Announcement (FOA) for Navy and Marine Corps Science, Technology, Engineering & Mathematics (STEM) Education, Outreach and Workforce Program, N00014-17-S-F002
- Project Period: 07/2018-07/2020
- Budget: $246,708

High-Order Positivity-Preserving Finite Difference Schemes for Robust Computation of Multi-Phase Flows

- Faculty: **Dr. Khosro Shahbazi**
- Funding Source: Office of Naval Research
- Project Period: 09/2017-08/2020
- Budget: $185,750

CappSci Inventors Award

- Faculty: **Dr. Prasoon Diwakar**
- Funding Source: CappSci & Frost Science Museum
- Project Period: 01/2018-12/2018
- Budget: $100,000

Collaborative Research: Bridging the gap between academia and industry in approaches for solving ill-structured problems

- Faculty: **Dr. Andrea Surovek**
- Funding Source: National Science Foundation
- Project Period: 8/2017 - 7/2020
- Budget: $90K
- Collaborative with Iowa State University

New Projects in 2017-18

Catching Rays—NASA HASP Project

- Faculty: **Dr. Jason Ash**
- Funding Source: NASA SDSGC Project Innovation Grant
- Project Period: 2018
- Budget: $33,351

Numerical Simulation of Turbulent Clouds

- Faculty: **Dr. Bamdad Lessani**
- Funding Source: SD Board of Regent
- Project Period:08/22/2018 - 08/21/2019
- Budget: $25,000

SDSM&T CubeSat Team Formation

- Faculty: **Dr. Jason Ash**
- Funding Source: NASA SDSGC Project Innovation Grant
- Project Period: 2017
- Budget: $5,000

Humidity Sensing and Active Control in an Electronics Enclosure- Communication Systems – West

- Faculty: **Dr. Hadi Fekrmandi**
- Funding Source: L3 Technologies (Sponsor)
- Senior design project
- Budget: $4,000

Faculty Research Publications in 2017-2018

Dr. Jason Ash

- A. Chakraborty, F. Thompson, **J. T. Ash**, P. Ahrenkiel, F. Kustas, and R. Anderson. (2018). "Use of Trilayer Shell Model to Determine Intrinsic Stress within Titanium-Silicon Carbonitride Coating." ASME International Mechanical Engineering Congress and Exposition, 87929, Pittsburgh, PA; Nov. 9-15, 2018.
- M. C. Jones, **J. T. Ash**, C. R. Tolle, and M. Smith. (2018). "Use of Ultrasonic and Audio Signals to Monitor Temperature in Stratospheric Balloons." ASME International Mechanical Engineering Congress and Exposition, 87131, Pittsburgh, PA; Nov. 9-15, 2018.
- A. Chakraborty, R. Anderson, S. P. Ahrenkiel, F. Kustas, and **J. Ash**. (2018). "Numerical Estimation of Intrinsic Stress in Physical Vapor Deposited Thin-Films." Surfaces & Coatings Technology, 350, 488-495, and presented by A. Chakraborty at 45th International Conference on Metallurgical Coatings and Thin Solid Films, San Diego, CA; April 23-27, 2018.
- A. Chakraborty and **J. T. Ash.** (2017). "Evaluation of Interfacial Stresses in a Bilayer Shell Subjected to Intrinsic Stress." ASME International Mechanical Engineering Congress and Exposition, 71950, Tampa, FL; Nov. 3-9, 2017.

Dr. Nickolaus Bruno

- P.J. Stonaha, M.E. Manley, I. Karman, R. Arroyave, **N.M. Bruno**, M. Chisholm, S. Chi, & D. Abernathy, "Glassy phonon heralds strain glass state in a shape memory alloy", Physical Review Letters 120 (2018) 245701.
- J.-H. Chen, **N.M. Bruno**, I. Karaman, Y. Huang, J. Li, J.H. Ross Jr., "Relative Cooling Power Enhancement by Tuning Magneto-structural Stability in Ni-Mn-In based Heusler Alloys", Journal of Alloys and Compounds 744;5 (2018) 785-790.
- **N.M. Bruno**, I. Karaman, J.I. Chumlyakov, "Orientation Dependence of the Elastocaloric Effect in $Ni_{54}Fe_{19}Ga_{27}$ Ferromagnetic Shape Memory Alloy", Physica Status Solidi B: Basic Solid State Physics 255;2 (2018) 1700437.
- **N.M. Bruno**, D. Salas, S. Wang, I. V. Roshchin, R. Santamarta, R. Arroyave, T. Duong, Y. I. Chumlyakov, & I. Karaman, "On the Microstructural Origins of Martensitic Transformation Arrest in a NiCoMnIn Magnetic Shape Memory Alloy", Acta Materialia 142 (2018) 95-106.
- **N.M. Bruno**, S. Wang, I. Karaman, Y. Chumlyakov, "Reversible Martensitic Transformation under Low Magnetic Fields in Magnetic Shape Memory Alloys", Scientific Reports 7 (2017) 40434.

Faculty Research Publications in 2017-2018

Dr. Cassandra Degen

- **Degen, C.M.**, **Muci-Kuchler, K.H.**, Bedillion, M.D., Huang, S., Ellingsen, M.D., "Measuring the Impact of a New Mechanical Engineering Sophomore Design Course on Students' Systems Thinking Skills", 2018 ASME International Mechanical Engineering Congress & Exposition, November 9-15, 2018, Pittsburgh, PA.
- Casey, C., Dulal, R., Clouse, D., **Degen, C.M**., Kellar, J. "Development of a Mechano-Responsive Ink for Security Printing", Society for Imaging Science and Technology Printing for Fabrication 2017, November 5-9, 2017, Denver, CO.
- Newkirk, J.R., **Degen, C.M**., **Romkes, A.** "Characterization of Thermoplastic Matrix Composite Joints for the Development of a Computational Framework", 2017 SEM XIII International Congress, June 12-15, 2017, Indianapolis, IN.
- Jensen, P.H., West, M., Kellar, J.J., Kellogg, S.D., Karlin, J., **Degen, C.M**. "Culture and Attitude: A scholarship, mentoring and professional development program to increase the number of women graduating with engineering degrees", 2017 ASEE Annual Conference & Exposition, June 25-28, 2017, Columbus, OH.
- **Degen, C.M.**, Huang, S., Ellingsen, M.D., **Muci-Kuchler, K.H**., Bedillion, M.D., Ziadat, J. "Leveraging a Newly Developed Sophomore Design Course to Increase Students' Career Awareness", 2017 ASEE Annual Conference & Exposition, June 25-28, 2017, Columbus, OH.
- **Muci-Kuchler, K.H**., Bedillion, M.D., Huang, S., **Degen, C.M**., Ellingsen, M.D., Nikshi, W.M., Ziadat, J. "Incorporating Basic Systems Thinking and Systems Engineering Concepts in a Mechanical Engineering Sophomore Design Course", 2017 ASEE Annual Conference & Exposition, June 25-28, 2017, Columbus, OH.

Dr. Prasoon Diwakar

- S. Wagner, M.Fernandez, , E. Orme, N, Manzano, T. Caplow, **P.K. Diwakar** (2018). "Exploration of Ambient Gas Effects on Laser Induced Breakdown Spectroscopy for Carcinogen Detection," SciX 2018 International Conference, Atlanta, GA, Oct 21-26, 2018
- M. Fernandez, S. Wagner, E. Orme, N, Manzano, T. Caplow, **P.K. Diwakar** (2018). "Analysis of Complex Emission Spectra From Samples Containing Carcinogen Using Laser Induced Breakdown Spectroscopy," SciX 2018 International Conference, Atlanta, GA, Oct 21-26, 2018
- E. Orme, M. Fernandez, S. Wagner, N, Manzano, T. Caplow, **P.K. Diwakar** (2018). "Analysis of Carcinogen in Products Containing High-Levels of Nicotine Using Laser Induced Breakdown Spectroscopy," SciX 2018 International Conference, Atlanta, GA, Oct 21-26, 2018
- H. Perez, N, Manzano, T. Caplow, **P.K. Diwakar** (2018). "STEM Education through Optics and Spectroscopy in an Public Facing Lab in a Museum Setting," SciX 2018 International Conference, Atlanta, GA, Oct 21-26, 2018
- **P. K. Diwakar** (2018). "Analysis of Carcinogens and Toxins Using LIBS/SIBS," SciX 2018 International Conference, Atlanta, GA, Oct 21-26, 2018

Dr. Hadi Fekrmandi, P.E.

- **Fekrmandi, H**., Hillard, J., & Staib, W. Design of a Bio-Inspired Crawler for Autonomous Pipe Inspection and Repair Using High Pressure Cold Spray.
- Lin, W., Rotenberg, Y., **Fekrmandi, H.,** & Levy, C. (2018). Buckypaper / DYAD / Buckypaper and Buckypaper/ DYAD/(polyaniline/multiwalled carbon nanotube) composite sensors: Preparation and damping properties characterization. Journal of Composite Materials, 52(11), 1457-1464.
- Gwon, Y. S., and **H. Fekrmandi**. "A data-driven approach of load monitoring on laminated composite plates using support vector machine." Smart Structures and NDE for Industry 4.0. Vol. 10602. International Society for Optics and Photonics, 2018.
- **Fekrmandi, H.**, & Gwon, Y. S. (2018, March). Reliability of surface response to excitation method for data-driven prognostics using Gaussian process regression. In Health Monitoring of Structural and Biological Systems XII (Vol. 10600, p. 106002R). International Society for Optics and Photonics.
- Baghalian, A., Tahakori, S., **Fekrmandi, H.,** Unal, M., Senyurek, V. Y., McDaniel, D., & Tansel, I. N. (2017). Implementation of the surface response to excitation method for pipes. In Mechanics of Composite and Multi-functional Materials, Volume 7 (pp. 261-266). Springer, Cham.

Faculty Research Publications in 2017-2018

- Tashakori, S., Baghalian, A., Unal, M., Senyurek, V. Y., **Fekrmandi, H.**, McDaniel, D., & Tansel, I. N. (2017). Load monitoring using surface response to excitation method. In Mechanics of Composite and Multi-functional Materials, Volume 7 (pp. 209-214). Springer, Cham.
- Lin, W., Rotenberg, Y., Ward, K. P., **Fekrmandi, H.**, & Levy, C. (2017). Polyaniline/multi-walled carbon nanotube composites for structural vibration damping and strain sensing. Journal of Materials Research, 32(1), 73-83.
- Baghalian, A., Tashakori, S., Senyurek, V. Y., McDaniel, D., **Fekrmandi, H.**, & Tansel, I. N. (2017). Non-contact quantification of longitudinal and circumferential defects in pipes using the surface response to excitation (SuRE) method. J. Prognostics Health Manage, 8, 1-8.

Dr. Pierre Larochelle, P.E.

- Ebert, T. and **Larochelle, P.,** "Dynamic Anchoring in Soft Regolith: Testing and Prediction", ASCE Journal of Aerospace Engineering, Vol.31, No.2, March, 2018. DOI: 10.1061/(ASCE)AS.1943-5525.0000792.
- Ishak, I., Moffett, M. and **Larochelle, P.**, "An Algorithm for Generating 3D Lattice Structures Suitable for Printing on a Multi-Plane FDM Printing Platform", Proceedings of the 2018 ASME International Design Engineering Technical Conferences, Québec City, Québec, August 26-29, 2018. Paper # DETC2018-85459. ASME Press.
- Moffett, M. and **Larochelle, P**., "Design of a 3D Printable Mechanical Time Simulating Solar System for use in STEM Education", Proceedings of the 2017 ASME International Design Engineering Technical Conferences, Cleveland, Ohio, August 6-9, 2017. Paper # DETC2017-68144. ASME Press.
- Li, J. and **Larochelle, P**., "Design and Development of a Mobile Robot Platform for Autonomous Ground Vehicle Research", Proceedings of the 2017 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, Montréal, Québec, May 25-26, 2017

Dr. Bamdad Lessani

- B. Zeinali, J. Ghazanfarian, **B. Lessani**, Janus Surface Concept for Three-Dimensional Turbulent Flows, Computers & Fluids, 170 (2018) 213-221.
- M.F. Azarkhavarani, **B. Lessani**, S. Tabejamaat, Artificial Compressibility Method on Half-Staggered Grid for Laminar Radiative Diffusion Flames in Axisymmetric Coordinates, *Numerical Heat Transfer, Part B: Fundamentals*, 75(2) (2017) 392-407.
- M.H. Nakhaei, **B. Lessani**, Effects of Solid Inertial Particles on the Velocity and Temperature Statistics of Wall Bounded Turbulent Flows, *International Journal of Heat and Mass Transfer* 106 (2017) 1014-1024.

Dr. Karim Muci

- Evans, J.J., Bost, A., **Muci-Küchler, K.H.** and DeVeaux, L.C. "Factors Affecting Use of Ballistics Gelatin in Laboratory Studies of Bacterial Contamination in Projectile Wounds". Military Medical Research, 2018 5:16. https://doi.org/10.1186/s40779-018-0164-7
- Bedillion, M.D.; **Muci-Küchler, K.H.** and Nikshi, W.M. "An Arduino-Based Hardware Platform for a Mechanical Engineering Sophomore Design Course". 2018 ASEE Annual Conference and Exposition, Salt Lake City, Utah, June 24 to 27, 2018. ASEE Paper ID # 21221.
- Ziadat, J. and **Muci-Küchler, K.H.** "Development of a Computational Model to Visualize Air Flow Into Surrogate Ballistic Wounds". 2017 ASME International Mechanical Engineering Congress & Exposition (IMECE 2017), Tampa, Florida, November 3-9, 2017. ASME Paper IMECE2017-70650.
- Aguirre-Rivas, D.A. and **Muci-Küchler, K.H.** "Formulation of a Higher Order Finite Element for Two-Dimensional Heat Conduction Problems". 2017 ASME International Mechanical Engineering Congress & Exposition (IMECE 2017), Tampa, Florida, November 3-9, 2017. ASME Paper IMECE2017-71201.
- **Muci-Küchler, K.H**.; Bedillion, M.D.; Huang, S.; **Degen, C.M**.; Ellingsen, M.D.; Nikshi, W.M. and Ziadat, J. "Incorporating Basic Systems Thinking and Systems Engineering Concepts in a Mechanical Engineering Sophomore Design Course". 2017 ASEE Annual Conference and Exposition, Columbus, Ohio, June 25 to 28, 2017. ASEE Paper ID #18819.
- **Degen, C.M**.; Huang, S.; Ellingsen, M.D.; **Muci-Küchler, K.H**.; Bedillion, M.D. and Ziadat, J. "Leveraging a Newly Developed Sophomore Design Course to Increase Students' Career Awareness". 2017 ASEE Annual Conference and Exposition, Columbus, Ohio, June 25 to 28, 2017. ASEE Paper ID # 19056.

Faculty Research Publications in 2017-2018

Dr. Daniel Rederth

- **D. Rederth**, R. Oszwałdowski, A.G. Petukhov, J.M. Pientka. *Multiband Electronic Structure of Magnetic Quantum Dots: Numerical Studies*, page 343

Dr. Albert Romkes

- V. Darrigrand, Á. Rodríguez-Roza, I. Muga, D. Pardo, **A. Romkes**, and S. Prudhomme, "Goal-Oriented Adaptivity using Unconventional Error Representations for the Multidimensional Helmholtz Equation," International *Journal for Numerical Methods in Engineering*, Vol. 113 (1) pp. 22-42, 2018. DOI:10.1002/nme.5601
- Joseph R. Newkirk, **Cassandra M. Degen**, and **Albert Romkes**, "Characterization of Thermoplastic Matrix Composite Joints for the Development of a Computational Framework," *Mechanics of Composite and Multi-functional Materials*, Volume 6: Conference Proceedings of the Society for Experimental Mechanics Series, P.R. Thakre et al., Editors. 2018, Springer International Publishing. DOI: 10.1007/978-3-319-63408-1_3.

Dr. Khosro Shahbazi

- **Khosro Shahbazi**, Robust second-order scheme for multi-phase flow computations, Journal of Computational Physics, 339 (2017) 163-178.
- N. Claggett, **A. Surovek**, W. Capehart, and **Khosro Shahbazi**, Termite Mounds: A Bio-inspired examination of the function of material and environment in structural form, Journal of Structural Engineering, ASCE, 44 (2018), 10.1061/(ASCE)ST.1943541X.0001977.
- Kayode M. Ajayi, **Khosro Shahbazi**, Purushothum Tukkaraja and Kurt Katzenstein, A Discrete Model for Prediction of Radon Flux through Fractured Rocks, International Journal of Rock Mechanics and Geothechnical Engineering (2018) 1-14 (in press)
- **Andrea Surovek**, Paul Bardunias, Tyrone Phillips, William Capehart and **Khosro Shahbazi**, Biomimicry of Natural Habitats: Integration of Structural Topology and Mechanical Function, 6th Structural Engineers World Congress, November 17 2017, Cancun, Mexico.
- Anil Baysal, P. Tukkaraja, **Khosro Shahbazi**, K. Katzenstein and D. Loring, Prediction of airflow resistance of a mature panel cave, proceedings of 16 th North American Ventilation Symposium, Golden, Colorado, June 12-17, 2017.
- Duruk Erogul, P. Tukkaraja, **Khosro Shahbazi**, K. Katzenstein and D. Loring, Evaluation of cave airflow resistance associated with multiple air gap geometries during cave evolution, Proceedings of 16 th North American Ventilation Symposium, Golden, Colorado, June 12-17, 2017.

Dr. Andrea Surovek, P.E.

- Claggett, N. **Surovek, A.**, Capehart, W. and **Shabazi, K**., "Termite Mounds: A Bio-inspired examination of the function of material and environment in structural form," Journal of Structural Engineering, ASCE, 10.1061/(ASCE) ST.1943-541X.0002043, July 2018.
- Akinci-Ceylan, S., Cetin, K., Fleming, R., Ahn, B., **Surovek, A.**, Cetin, B., and Taylor, P., Bridging the Gap Between Academia and Industry in Approaches for Solving Ill-Structured Problems: Problem Formulation and Protocol Development, *Proceedings of the 2018 American Society of Engineering Education Annual Conference and Exposition,"* Salt Lake City, UT, June 2018
- Benning, J., **Surovek, A**., Shearer, C., Kellogg, S., "Engagement in Practice: A case study on improving community sustainability through service learning," *Proceedings of the 2018 American Society of Engineering Education Annual Conference and Exposition,"* Salt Lake City, UT June 2018
- **Surovek, A.**, and Rassati, G.A., "Is Structural Engineering Education Creating Barriers to Innovation and Creativity?" *Proceedings of the 6th Structural Engineers World Congress*, Cancun, Mexico, Nov. 2017.
- **Surovek, A.**, Bardunias, P., Phillips, T., Capehart, W. and **Shahbazi, K**., "Biomimicry of Natural Habitats: Integration of Structural Topology and Mechanical Function," *Proceedings of the 6th Structural Engineers World Congress*, Cancun, Mexico, Nov. 2017.
- Long, A., Benning, J., Shearer, C., **Surovek, A.** and Kellogg, S., "Promoting Sustainability in Engineering Through an EPICS Program," *Proceedings of the XV LACCEI 2017 International Multi-Conference*, Boca Raton, FL July 2017.

Faculty & Student Awards in 2017-2018

- **Dr. Ash** received the 2018 Outstanding Volunteer Award for South Dakota FIRST Lego League State Championship, as well as the 2017 ME Department Award for ASME/SEDS Advising and Student Success.
- **Dr. Bruno** received a reviewer honorarium from Acta Materialia in April 2017 for reviews to the journal in 2016.
- **Dr. Degen** received the Hardrocker athletics soccer professor recognition award in Fall 2017 and was the mechanical engineering department nominee for the 2017 SD Mines Research Award. Dr. Degen is the recipient of the 2018 Outstanding Recent Graduate Award from the SD Mines Department of Materials and Metallurgical Engineering.
- **Dr. Diwakar** received honorable mention for the 2018 OSA Diversity and Inclusion Advocacy Recognition.
- **Dr. Lessani** received a certificate of outstanding contribution in reviewing from the International Journal of Heat and Mass Transfer.
- **Dr. Rederth** received the 2018 Outstanding Recent Graduate Award from the SD Mines Department of Physics.
- **Dr. Romkes** is the recipient of the 2018 South Dakota School of Mines & Technology Faculty of Honor, as well as the recipient of the 2018 SD Mines Center of Excellence for Advanced Manufacturing and Production (CAMP)'s James & Connie Green CAMP Award.
- Student Awards:
  - 2018
    - **SDSM&T Moonrockers** 4th place Mining, 7th Place Overall in 2018 NASA Robotic Mining Competition
    - **Jeremy Adams**, SDSM&T Leadership Hall of Fame
    - **Cody Cooper**, Outstanding Co-op/Intern Award
    - **YunSeok Gwon**, Dr. Fekrmandi's MS student, received the 2018-19 Ivanhoe Excellence Fellowship.
    - Dr. Larochelle served as the Faculty Advisor to **Ismayuzri Ishak** and **Mark Moffett** (doctoral students) who were awarded a $1,250 travel grant in the 2018 NSF/ASME Design Essay Competition to attend the 2018 ASME International Design Engineering Technical Conferences in Québec City, Québec for their winning essay "Holonic Manufacturing Systems for Agile Manufacturing".
    - **Josiah Horner**, 1st Place in ASME Old Guard Poster Competition, ASME E-Fest West 2018
    - **Austin Kaul**, ASME Foundation Scholar
    - **Samuel Ryckman**, ASME Garland Duncan Scholarship
    - **Joree Sandin**, SDSM&T Leadership Hall of Fame
  - 2017
    - **SDSM&T Moonrockers** 13th place Mining, 20th Place Overall in 2017 NASA Robotic Mining Competition
    - **Becca Ceremuga**, Outstanding Co-op/Intern Award
    - **Josiah Horner**, ASME Frank & Dorothy Miller Scholarship
    - **Austin Kaul**, ASME Foundation Scholar & Tau Beta Pi Scholar
    - **Michael Kelly**, 1st Place in ASME Old Guard Poster Competition, ASME E-Fest West 2017
    - **Tyler Ronken**, ASME John & Elsa Gracik Scholarship
    - **Brenton Svitak**, SDSM&T Leadership Hall of Fame

Remember Your Alumni Association

The South Dakota School of Mines & Technology Alumni Association promotes communication and interaction among alumni, students, faculty, and administrators of the South Dakota School of Mines and Technology, with the objective of strengthening the school's academic, research, and service roles. Whether through the *Hardrock* or the *Hardrock E-News*, area meetings or reunions, the Alumni Directory or award programs, they are here to help you and to help our alma mater. So please consider supporting your Alumni Association with your contributions and your time. Learn more!

Thank You to Our Industry Donors

The Department of Mechanical Engineering works to provide an exceptional academic experience for our students. This could not be possible without the generous support of our industrial partners. We would like to extend our gratitude to the following companies who have supported our department: A&B Welding Supply; Cargill, Inc.; Fastenal Company; John Deere; Neiman Enterprises, Inc.; Nucor Corporation; Shoener Machine & Tool Supply Inc.; and Yaskawa Electric Corporation.

ME Industrial Advisory Board

We wish to thank our industrial advisory board members for their significant and outstanding service to the department! The ME IAB meets twice a year to provide guidance for improving the standards of the department.

Ericka Amborn, *ME09, MS,* Applied Research Associates, Rapid City, SD
Dave Berg, ***ME73,*** Rapid City, SD
Randy Clarksean, *ME83, PhD,* Consultant., Ottertail, MN
Don Cuperus, *ME95,* SD Manufacturing & Technology Solutions, Sioux Falls, SD
Paul Gnirk, *MINE59, PhD,* Table Top Ranch Inc., New Underwood, SD
Patrick Hallauer, ***ME76,*** New Covenant Consulting, Omaha, NE
Erin Heupel, *MET88,* Biogenic Reagents, Sioux Falls, SD
Tim Holleman, *ME71,* Medtronic Inc./Retired, Ham Lake, MN
Wayne Mills, ***ME85***, John Deere Power Systems, Waterloo, IA
Mike Mueller, ***ME85,*** Regional Health, Rapid City, SD
Larry Pearson, ***ME72,*** Bennington, NE
Scott Reisenauer, ***ME94,*** B9Creations, LLC, Rapid City, SD
Mike Rizor, ***ME90,*** Cargill, Inc., Kansas City, MO
Paul Schroder, *ME78,* Pella Corporation, Pella, Iowa
Matthew Schulte, *ME09,* Burns & McDonnell, Overland Park, KS
Paul Sheets, *ME91,* Carbon River Engineering, LLC, Wichita, KS
Daniel Weinacht, *ME84, PhD,* Ares Corporation, Richland, WA
Dale Wilen, ***ME85,*** City University, Cheyenne, WY

Fall 2017 Graduates

Doctorate of Philosophy

Ryan Koontz

Bachelor of Science

Brian Beaudin
Andrew Chenoweth
Cody Clement
Collin DeCora
Zachary DeJong
Gerrit DeVries
Jacob DeWeese
Zachary Erickson
Timothy Faulconer
Justen Gelling
Lance Hanson
Charles Hartman
Mitchell Hoff
Carter Johnson
Kellan Johnson
Jordan Landen
Kane Larson
Karli Mattson
David Maxey
Nathan Moser
Tung Nguyen
Sarah Novitzki
Nicholas Radzykewycz
Logan Roberts
Tyler Rossi
Silas Schaeffer
Gregory Schmidt
Matthew Seidel
Aaron Spies
Shannon Spronk
Brenton Svitak
Chad Sykora
Cheyanne Tidrick
Camden Veurink
Robert Wiley

Spring & Summer 2018 Graduates

Doctorate of Philosophy

Kayode Ajayi
Walelign Nikshi

Master of Science

Yoseph Kigeneh
Joseph Newkirk
Nathan Scholl

Bachelor of Science

James Anderson
Nathan Baatz
Luke Bauske
Skyler Brungardt
Chad Buse
Michael Bush
Corwin Coldman
Cody Cooper
Darrin Dimmitt
Sean Earley
Ryann Eckblad
Tyler Ehnert
Garrett Funk
Kevin Grimsted
Trevor Gunderson
James Hann
Andrew Holmberg
Aaron Iversen
Trevor Jerome
Devon Jones
Joshua Kajer
Austin Kaul
Sean Kittler
Noah Klamm
Eric Krebs
Hans Leong
Brandon Lind
Jordan Liske
Samuel Magnuson
Francis Marso
Jacob Maxfield
Jakob Meier
Casey Moeller
Luis Muci-Castaneda
Nathan Patterson
Bo Paulsen
Jason Pedersen
Robert Pippenger
Kari Pulli
Carson Purtell
David Reinhardt
James Roussel
William Rude
Joree Sandin
James Sellens
Biru Sharma
Tanner Shipman
Colten Shipper
Westley Skogen
Joshua Thomas
Garret Trupe
Lyle Vaz
Aaron Vogel
Eric Volesky
Samuel Vollmer
Albert Warns
Samuel Wendte
Marcus Wiebe
Joshua Witte