



SOUTH DAKOTA MINES

An engineering, science and technology university

Department of Mechanical Engineering

Fall/Winter 2021

A Message from the Department Head



This has been a most exciting fall semester! In August, we welcomed back our students to fully on-campus “normal operations” with classrooms, dorms, labs, and, most importantly, the hands-on, project-based learning that we’re so well known for. Despite the pandemic, enrollment in mechanical engineering continues to grow. This fall’s incoming class of mechanical engineering students is the 4th largest in department history! Even during the pandemic, our family continues to grow! We are delighted to welcome Dr. Joseph John Thalakkottor (Dr. T) as our newest faculty member. Dr. T’s research interests are focused on gaining a deeper understanding of the nature, behavior, and effects of features existing at the limits of continuum field theory. Common examples of these features, which are traditionally represented as discontinuities, are material interfaces, vortex sheets, shock fronts, and combustion fronts. He is in the process of establishing a new Laboratory of Interfacial Transport (LIT).

In the fall semester, the department “launched” a new aerospace engineering minor. Our students now have the opportunity to take a few additional courses and earn a credential that gives them a high-quality, competitive edge for seeking opportunities in our nation’s exciting aerospace industry.

Our students and faculty continue to amaze us with their accomplishments and awards. Of special note are the awards and scholarships that our faculty and students have received. You’ll read about these and more in the following sections.

In closing, I would like to take this opportunity to wish everyone in your Hardrocker family a most joyous holiday season. I sincerely wish that you and your loved ones remain safe and healthy as we progress toward the end of the pandemic.

Dr. Pierre Larochelle, P.E.

Department Head, Department of Mechanical Engineering



Dr. Richard Pendleton passed away at the age of 85 on June 17, 2021. Dr. Pendleton served as a faculty member in the mechanical engineering department from 1973 to 1996 and continued on as a professor emeritus after his retirement to teach in 1997 and 2003-05. He served his time in the department teaching various courses—including machine design—building up the design area, and constructing new labs. Dr. Pendleton was an invaluable addition to the department and will be missed. [Click here to view Dr. Pendleton's obituary and sign his guestbook.](#)



[Click here to see a list of our graduated students and new research awards and publications from the 2020-21 academic year.](#)

Terrence Kuca is the first recipient of the ME Doctoral Fellowship, which is available to master's degree-seeking students who decide to pursue a PhD degree in mechanical engineering at South Dakota Mines. Terrence received his BS and MS before entering the PhD program in Fall 2021. His research focuses on experimenting, modeling, and simulating dust explosions using computational fluid dynamics.

Terrence presented the first seminar of the Fall 2021 ME Seminar Series. To view his presentation and more, [click here](#).



The ME Doctoral Fellowship Program was initiated in Fall 2019 from generous donations of ME alumni and faculty. This program offers up to \$25,000 in support to selected students. We are continuing our fundraising efforts and appreciate the support from alumni, industrial partners, and friends of the department.

[Donate Now](#)



Beginning Fall 2021, the Department of Mechanical Engineering began offering a new minor in aerospace engineering. The aerospace engineering minor already has a handful of enrolled students. The program is expected to grow with the development of new, specialized courses like space flight mechanics and aerospace structures. Raven Industries has been a key player in industrial support to develop the aerospace engineering minor. Early in 2021, [the company donated \\$25,000](#) for the development of an aerospace engineering lab.

Faculty Addition



Dr. Joseph John Thalakkottor completed his undergraduate studies in mechanical engineering at Cochin University of Science and Technology, India. After completing his undergraduate education, he worked as a senior design engineer at the Shipbuilding Division of Larsen and Toubro Ltd. During his two-year stint there, he provided design support for the building of a heavy lift semi-submersible vessel, for RollDock, Netherlands, and another heavy lift vessel for BigLift Shipping, Netherlands. From there, he pursued his master's and doctoral degrees in mechanical engineering at the University of Florida under the guidance of Dr. Kamran Mohseni. He spent another two years as a postdoctoral associate before joining the School of Mines in Fall 2021.

His research is focused on gaining a deeper understanding of the nature, behavior, and effects of flow features existing at the limits of continuum field theory using computational tools. Common examples include a vortex sheet, shock front, combustion front, and gravity wavefront. Read more about his research and the Laboratory of Interfacial Transport ([LIT](#)).

When not working, he loves spending time hiking, photographing nature, and getting his hands dirty either through DIY projects or volunteering in the community.



The Gene Haas Foundation, established by Haas Automation, Inc. Founder and CEO Gene Haas, has been a generous benefactor and supporter of the Department of Mechanical Engineering. With the foundation's contributions, we have established the Haas mentor program to support student activities. [Read more here.](#)



Margaret Thompson has been selected as the Women's Summit Award winner at the 2021 RMAC Championships. A current mechanical engineering senior, Margaret is also enrolled in the ME accelerated master's program. Recipients of the RMAC Summit Awards are of sophomore or higher standing with high GPAs. With a 4.0 GPA, Margaret is a deserving recipient of this award. An outstanding student academically and athletically, Margaret was honored on Saturday, October 23rd, at the conclusion of the 2021 RMAC Championships in Golden, CO. For more information, [click here.](#)

Student Achievements

Inducted into the 2021 Leadership Hall of Fame, ME junior Ian Helgeson was recognized as an Outstanding Student Organization Member for the Society of Physics Students, and ME senior Blake Hyla was recognized as an Outstanding Student Organization Member for Moonrockers.



Kaytie Barkley, a graduate student in the Department of Mechanical Engineering, won a prestigious NASA Space Technology Graduate Research Opportunity to research a process called ultrasonic welding that utilizes low amplitude, high-frequency vibrations to fuse two pieces of plastic together. Kaytie's award was one of only 58 that NASA selected in the US. [Read more about Kaytie's work and the NASA award here.](#)



The mechanical engineering office proudly displays scaled models and projects from companies where our students have completed an internship or co-op experience. Next time you visit the campus, stop by Civil/Mechanical 129 to have a look.



Recent ME graduate Christina Taylor was offered and accepted an NSF Graduate Research Fellowship ([GRFP](#)) in the field of computational mechanics. Christina graduated in Spring 2019 with her BS degree and minors in math and computer science. She is currently at Rice University, where she is pursuing her PhD in computational and applied mathematics. Christina credits her time at Mines and the mentorship she has received from various individuals for her GRFP. [Read her acknowledgment here.](#)



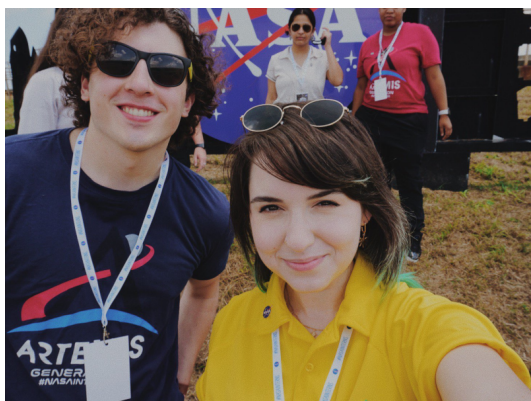
The SD-First program at South Dakota Mines, funded by a \$998,819 grant through the National Science Foundation S-STEM program, is committed to helping first-generation students find academic success. Dr. Cassandra Birrenkott, associate professor in the mechanical engineering department, leads the SD-First program. Students accepted into the program have access to a myriad of support, including faculty and student mentors, workshops, special events, and financial assistance. [Read more here.](#)

Additional news coverage about the SD-FIRST program can be found here:

[SDPB News](#)

[Rapid City Journal](#)

[KELOLAND](#)



Kole Pickner (pictured left, at a weekend trip to Kennedy Space Center with a random selection of NASA interns), a mechanical engineering senior who is enrolled in the accelerated master's



ME master's student James Gormley won a \$5,000 stipend from NASA for his research in laser-induced breakdown spectroscopy. James was one of three Mines students to receive stipends for

James and Kole are two of 28 students selected for scholarship and research funding from the South Dakota Space Grant Consortium (SDSGC) in 2021. [Read more about the support Mines students have received from SDSGC here.](#)

Congratulations to South Dakota Mines mechanical engineering professors, [Cassandra Birrenkott](#) and [Dr. Karim Muci](#), and their co-authors Drs. [Mark Bedillion](#), [Marsha Lovett](#), and [Laura Pottmeyer](#), for their paper "[Building and Revising an Assessment to Measure Students' Self-Efficacy in Systems Thinking](#)." This paper was selected as the ASEE Systems Engineering Division's (SED) Best Paper for the 2021 Conference. Their achievement was recognized during the virtual conference on July 28th, 2021.

E.R. Stensaas Chair and assistant professor [Dr. Micah Lande](#) was named a [2021 Engineering Unleashed Fellow](#) and was recognized for his contribution to engineering education. Dr. Lande joined the ME department in 2019 and oversees the Holistic Engineering Lab & Observatory ([HELLO](#)). His research activities focus on design thinking & making, design education, and engineering education.



Innovation has always played a key role in a South Dakota Mines education, and that is more well-known than ever before due in part to faculty such as Dr. Lande. South Dakota Mines has recently been included in the list of the [Best Maker Schools in Higher Education](#), and, in the February 2021 issue of Prism magazine's article [DIY By Design](#), Dr. Lande noted the importance of maker spaces. The ME department has been in the process of developing and improving student spaces. With the recent additions of student design spaces affectionately termed "The Aquarium" (pictured below left) and "The Zoo" (pictured below right), students are encouraged to collaborate, imagine, and build innovative projects for courses and extracurricular activities.





Mechanical engineering master's student Christian Leckband attended the 2021 [SciX Conference](#) in Providence, RI, with his advisor, Dr. Prasoon Diwakar, where he won the Best Student Poster Award. Christian's research focuses on cold atmospheric plasma-induced defects in 2-D graphene, with potential applications of the research to either hinder or promote the growth of biofilms. His research advances the field's understanding of controlling biofilms. Christian intends to pursue his PhD in ME to continue his research in corrosion control via coatings or surface treatments to identify how these affect the mechanical properties of materials. Additionally, he plans continued research in particular engineering practices such as investigating different materials for longer-lasting prosthetics and batteries.



Mechanical engineering doctoral student Anurag Chakraborty has been selected as the recipient of the 2021-22 Richard Sekar Fellowship. The fellowship is awarded annually to an international mechanical engineering graduate student.



Sean Hayes has been selected as this year's Outstanding Recent Mechanical Engineering Graduate. Sean graduated with his BS degree in 2010 from South Dakota Mines. He was hired as an engineer at Caterpillar, Inc. shortly after graduation and has since been promoted to a Wear Parts Specialist for the company. In addition to serving on the South Dakota Mines Foundation Board of Trustees, Hayes helped build a chapter for Young Professionals at the Decatur office of Caterpillar.

As a student at South Dakota Mines, Sean was an active member of the Hardrocker Racing Team (Formula SAE) and the American Society of Mechanical Engineers; he has continued supporting these teams to this day and has coached two middle school teams to state competitions for the First LEGO League.

Sean was presented his award at the Outstanding Recent Award banquet on Friday, September 24, 2021.



Congratulations to our 2020-21 Outstanding Mechanical Engineering Juniors!

Rachel Lauer and **Benjamin Ramseyer** (not pictured)



Congratulations to our 2020-21 Outstanding Mechanical Engineering Seniors!

Armand Lannerd and **Samuel Ryckman**

Armand is also the recipient of the Gustafson Student Leadership Award. This award recognizes a junior or senior who achieves scholastic success and demonstrates exemplary leadership and commitment through his or her involvement in campus activities and organizations.

Samuel was also recognized as an Outstanding Student Organization Member for the American Society of Mechanical Engineers at the 2021 Leadership Hall of Fame.



Congratulations to our 2020-21 Outstanding Graduate Student!

Terrence Kuca



Congratulations to the recipients of the 2020-21 Outstanding Undergraduate and Graduate Student Service to the ME Department awards!

Taylor Muncie (undergraduate) and Strauss Langrud (graduate)

Help us stay connected with you! [Update your information](#) with the South Dakota Mines Center for Alumni Relations and Advancement (formerly SDSM&T Alumni Association and Foundation, which merged in July 2020).

ME at a Glance

99%

South Dakota Mines ME graduate placement rate

\$64,246

Average starting salary for AY 2020-21 BS ME graduates

77%

Internship rates for AY 2020-21 graduates

\$20/hour

Average internship or co-op salary

517

Undergraduate Students – 2021

20

Graduate Students – 2021

18

Full-time Faculty

63

BS ME graduates in AY 2020-21

7

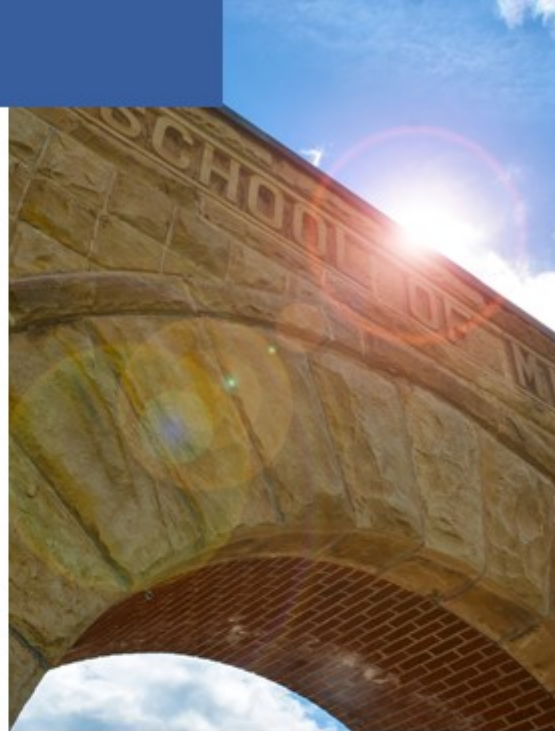
MS ME graduates in AY 2020-21

42

Total number of faculty publications and presentations in AY 2020-21

\$21.2M

Total amount of new research funding obtained in AY 2020-21



Faculty

Professors

Dr. Duane Abata
Dr. Pierre Larochelle (department head)
Dr. Demitris Kouris
Dr. Karim Muci

Associate Professors

Dr. Jason Ash
Dr. Cassandra Birrenkott
Dr. Albert Romkes
Dr. Khosro Shahbazi
Dr. Weibing Xing (Pearson Endowed Chair)

Assistant Professors

Dr. Nickolaus Bruno
Dr. Prasoon Diwakar
Dr. Hadi Fekrmandi
Dr. Joseph John Thalakkottor
Dr. Micah Lande (E.R. Stensaas Chair for Engineering Education)

Instructor

Ardell Knudson

Lecturer

Dr. Aaron Lalley
Dr. Peter McKeon
Dr. Daniel Rederth

Research Scientist IV

Dr. Andrea Surovek

Staff

Brittany Brzozowski – Secretary
Leslee Moore – Program Assistant I
Vasilii Tseptsura – Machinist (Equipment Technician)

Spring 2021 Career Fair

126 companies recruited (virtually)

80 recruited ME students

Fall 2021 Career Fair

119 companies recruited (in person)

87 recruited ME students

81 companies recruited (virtually)

53 recruited ME students

FOR MORE INFORMATION

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