

IMPULSE

JEROME J. LOHR COLLEGE OF ENGINEERING



SPRING 2018



Lewis Brown '84 Ph.D.
Dean of Engineering

DEAR ALUMNI AND FRIENDS,

PARTNERSHIPS THAT PAY DIVIDENDS

Academic year 2017-18 will be in the books by the time many of you read this column. As you browse through this issue you will see what a fantastic year it has been.

We've just finished with the spring Dean's Advisory Council meeting. It's truly a privilege to have regional industry leaders on campus to engage with and help set the strategic goals for the Jerome J. Lohr College of Engineering. We were also honored this year to have our college namesake Jerry Lohr sit in on the meeting.

Stinger Ghaffarian Technologies, the contractor which manage EROS Data Center in Baltic, a longtime partner of the college, opened an on-campus office in Daktronics Engineering Hall earlier this year.

SGT employs four student interns as well as Kevin Moe, who has served on the Dean's Advisory Council for many years, and Jason Werpy, an adjunct instructor with the college. SGT will now enjoy operating an office in the heart of the Electrical Engineering & Computer Science Department on our campus.

DGR Engineering, headquartered in Rock Rapids, Iowa, has partnered with SDSU for years and has employed many a grad. Employees there are now giving \$7,100 annually in scholarship gifts. That's grown from \$1,500 a decade ago. It reflects both a corporate focus and a sense of appreciation and loyalty from the 23 former SDSU students who now work at DGR and donate to the scholarships.

What an impressive role model for others! That giving helps keep us competitive in attracting the region's top students.

EDUCATION OUTSIDE OF CLASS

Students like Jace Waybright, a sophomore mathematics and physics major, who became only the 10th Goldwater Scholar in school history. He also was one of six undergraduates nationwide chosen to participate in an international nanotechnology Research Experiences for Undergraduate program.

Waybright is but one beaming example of how students succeed in our college and find activities outside the classroom to further stretch themselves.

One example is our cover story, the brand-new CubeSat club. This group, led by second-year faculty member Marco Ciarcià, is seeking to become the first group in South Dakota to launch a high-altitude balloon satellite. This is through a NASA program and has attracted interest from more than 50 students from a variety of majors.

The students launched a prototype during Engineering Expo April 20, the last major student event of the college year before graduation.

Our student organizations continue to win regional and national competitions while competing against the country's largest and most famous schools. It goes to show that a team of Jackrabbit STEM majors can compete with anyone!

SO LONG AND FAREWELL

The end of the school always brings goodbyes and in this issue we say goodbye to Fereidoon "Fred" Delfanian, who has taught mechanical engineering since 1980, and Thomas Roe, who taught mathematics and statistics since 1983. Fred and Tom will be missed immensely!

Speaking of goodbyes, it also is time for me to bid farewell. I have been on the SDSU faculty since 1992 and served as dean since 2001. It's been a terrific time of growth and improvement—what a privilege for me to serve as dean during these 17 years!

I would like to thank some people for our successes during my tenure as dean: our outstanding students, faculty, staff, the college leadership team members, our generous donors, Jerry Lohr, the presidents and provosts I have served, the outstanding campus support units, and you our alumni. I have so enjoyed working with this great team.

While my stay as dean ends June 21, my life as a proud Jackrabbit does not end. I know you feel the same way and remember you are always welcome on our campus at any time. I hope you enjoy this edition—thanks for your continued success.

NOTE: My email address after June 21st will be 2Browns@Swiftel.com



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STATE UNIVERSITY**

*Jerome J. Lohr College
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ABOUT THE COVER

Members of SDSU's Human Powered Vehicle Team gather around FlapJack, the mechanical engineering students' creation for the American Society of Mechanical Engineering contest. They are pictured at FairPlex in Pomona, California, where the team won the West regional March 25. On April 15, the team won the East regional to make them the undisputed national champs.

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IMPULSE

SPRING 2018



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JEROME J. LOHR
COLLEGE OF ENGINEERING



BROWN LEAVING BEHIND A FAR DIFFERENT COLLEGE

Seventeen years after he became dean, Lew Brown is leaving the college he has been a part of for almost 40 years and continuously connected to since 1992.

The college Brown will retire from June 21 is much different from the one he enrolled in as a nontraditional student in August 1980, than the one he began to teach at in January 1992 and the one he took the reins of July 1, 2001. The difference goes far beyond the “everybody has a computer now” societal shifts that changed all organizations.

In fact, the College of Engineering isn’t even called the College of Engineering now. It’s the Jerome J. Lohr College of Engineering.

That change was made in 2013 to honor the man whose financial generosity, contagious inspiration and long-sighted vision has moved the university in general and the college in particular into an academic echelon few previously imagined. Lohr, a 1958 civil engineering grad, was kindling a fire in the college while Brown was still serving as head of the electrical engineering department.

The fire roared in the years that followed as the men worked together to spur five major building projects to completion.

In the course of Brown’s 17 years as dean, the college has benefited through:

- The investment of more than \$40 million in facilities, a good share coming from private funds;

- The vast expansion of its academic footprint—more than 40 new major and minor programs, including six new bachelor’s degrees, 10 new master’s degrees and five new Ph.D. programs; and
- Strong enrollment growth—up 45 percent in total enrollment—1,324 in 2001 to 1,918 in fall 2017.

Lohr calls the change in the college “dramatic.”

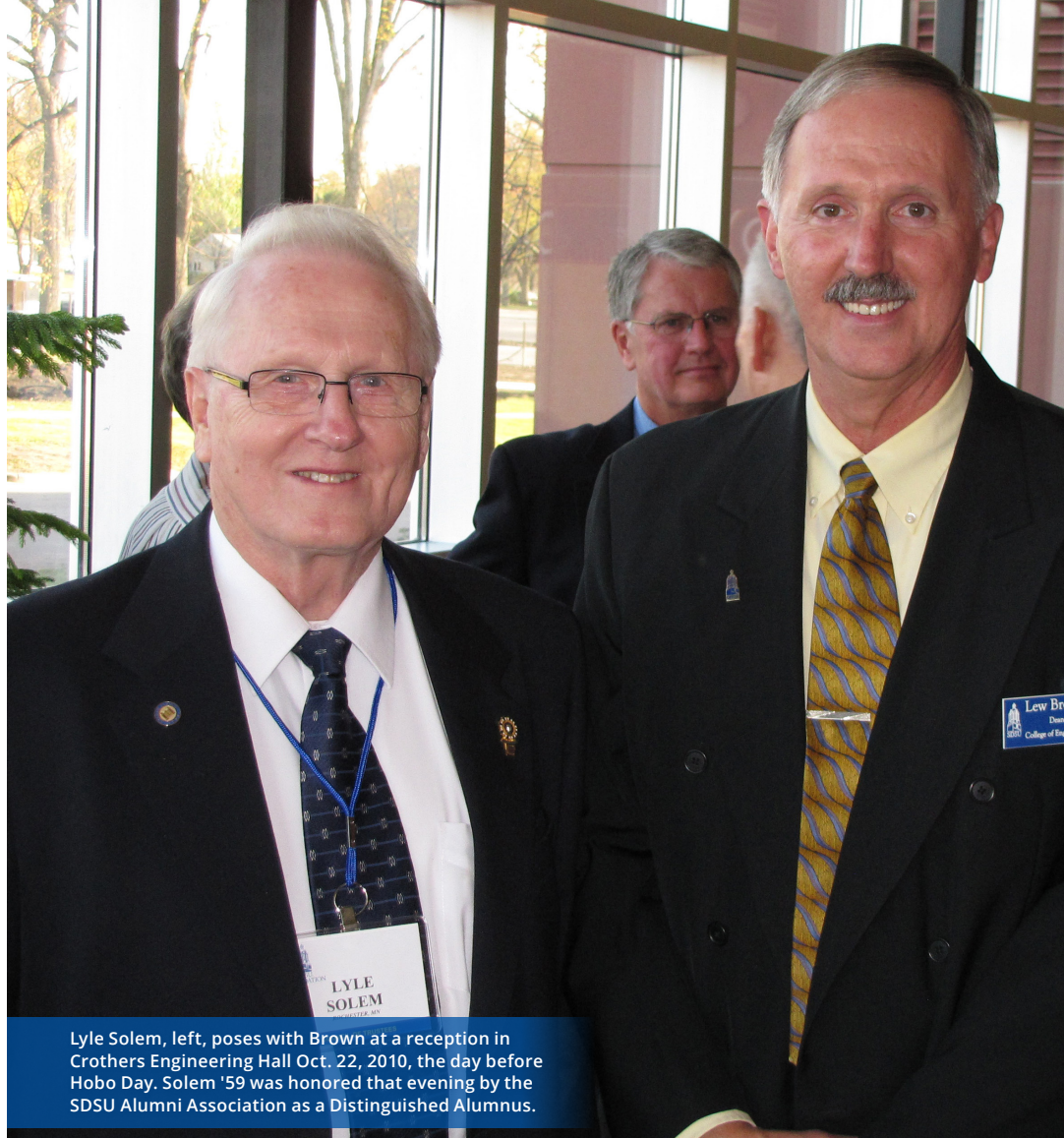
“When I became active 30 years ago, the SDSU College of Engineering was about to lose accreditation for both civil and mechanical engineering because of lack of laboratory space. Engineering was centered in Crothers but activity was spread all over the campus. Lew presided over a quadrupling of space, a very effective consolidation of faculty and student spaces and a greatly improved faculty and student experience,” Lohr said.

A QUALITY COLLEGE NEEDING TO IMPROVE

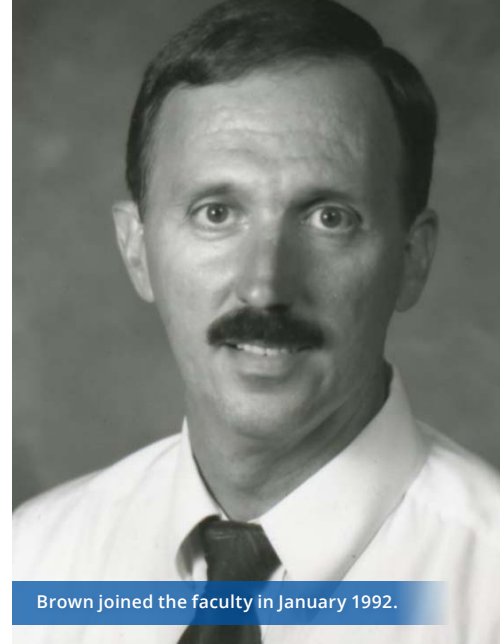
Brown recalls that when he became dean, the college had changed very little.

There is a sense in which that isn’t bad. The college has had a strong reputation since the days of Halvor Solberg 100 years before Brown became dean.

“Once I learned about (Charles) Coughlin, (Stephen) Briggs, (Harold) Crothers and Solberg, I couldn’t imagine having better professors on a campus. I took it as a personal challenge when I returned in 1992 to make sure that tradition of academic rigor



Lyle Solem, left, poses with Brown at a reception in Crothers Engineering Hall Oct. 22, 2010, the day before Hobo Day. Solem '59 was honored that evening by the SDSU Alumni Association as a Distinguished Alumnus.



Brown joined the faculty in January 1992.



Brown congratulates Qiquan Qiao, who was named the Harold C. Hohbach Associate Professor at an investiture ceremony Oct. 21, 2016, the afternoon before Hobo Day.

and concern for students would go on,” said Brown, adding that he grew to appreciate his baccalaureate background when he enrolled at Iowa State to get his master’s and doctoral degrees.

“Then each time I visited here, I made sure to thank (Virgil) Ellerbruch and (Duane) Sander for how they taught me,” he said.

The electrical engineering professors would eventually serve in the position Brown now leaves. Sander served as dean from 1990 to 1999. Ellerbruch followed in a co-deanship with Aelred Kurtenbach until Brown moved into the dean’s office.

FACILITIES HAD BECOME OUTDATED

While the college continued to produce phenomenal graduates in the years since Brown’s graduation in 1984, they were learning in facilities built in the 1950s or earlier. The computer science program was housed in the Administration Building. Solberg Hall, originally built in 1901, was vacated in 1998 when it was deemed unsafe.

Several departments, including mainstays electrical and mechanical, were housed in Harding Hall, which was built in 1954 as a dormitory.

Planning was underway for an upgrade and expansion of 1957-built Crothers Hall before Brown became dean. Construction began in spring 2001 and the south end of campus was under almost continuous construction until the Architecture, Mathematics and Engineering Building was completed in 2015.

In total, it was five building projects, 213,735 square feet of new construction, including Solberg, major upgrades to utility and safety systems to Crothers and \$41.3 million.

“There has been a transformational impact on the College of Engineering. The new facilities put us on a par with any of our peers that we compete with for talented faculty and students,” Brown said in anticipation of the groundbreaking for the Architecture, Mathematics and Engineering Building.

‘THE PEOPLE I’VE MET’

Prior to this 21 century flurry of construction work, universities counted on state legislators to fund their projects. The lines on that chart had largely been redrawn by the time Brown became dean. In the years following, they’ve only become more firm. Brown had gotten a taste while EE department head during the planning for the Crothers Hall project in 2000-01.

“It was something that was foreign to me 18-19 years ago. Now I love it,” Brown said of fundraising, currently a major facet of any dean’s job.

“It’s something I’ve become very comfortable doing because it’s about aligning the dreams of donors to the needs of the college to advance students. Any time you can do that, it’s really satisfying. It’s brought me in contact with incredible people over the years. One of the things I’m most grateful for is getting to meet the people I’ve gotten to.



Brown sits with John Hanson as he signs a memorandum of agreement to create the John Hanson Professorship in Structural and Construction Engineering in the Jerome J. Lohr College of Engineering.



Gathered at the Faculty Celebration of Excellence Feb. 21, 2012, are, from left, Brown, Distinguished Professor Dennis Helder and then-Provost Laurie Nichols.

“I’ve met CEOs, astronauts, presidents of companies, etc. How would I otherwise have had a chance to do that?”

LOHR’S ‘TREMENDOUS’ IMPACT

Despite their position, Brown has found most to be ordinary folks. He said the same could be said of Lohr, who is as comfortable in jeans on his acreage near Garretson as he is at his Monterey County, California, mansion and vineyard. “We’ve been partners, we’ve been friends all these years. He’s certainly someone I can talk to at any time and have an honest conversation about anything.”

Soon after Brown became dean, he said he got an invitation to meet Lohr in California.

“Since then, we’ve spent countless hours on planning for fundraising for all our building projects. He’s no doubt had a tremendous impact on this college; more than any other person,” said Brown, adding the current renovation in Crothers will include a display cabinet near the west entrance on the main level that will tell Lohr’s story.

BROWN FINDS A HOME IN SOUTH DAKOTA

Brown’s story began in Arlington, Virginia, where he spent all of nine months as the son of a career U.S. Air Force airman. Home was a family, not a place.

Lew joined the Air Force after graduating from Mitchell High School in Colorado Springs in 1971. By the time Lew left the Air Force in 1976, his family had settled in Oldham, not far from his dad’s childhood home of Madison. Brown spent 15 months as part of the Oldham business community, operating Lew’s Repair, keeping cars running and various electronics humming.

He was 27 when he started college and also was working as a biomedical engineering technician at the Brookings Hospital.

By May 1984, Brown, 31, had earned his electrical engineering degree and was married to Oldham native Danelle Leonhardt and had two children. While Brown loved living in South Dakota, career opportunities were rare for electrical engineers in the state. Following graduate school and the addition of two more daughters, Brown found a great job with Atochem Sensors as a senior research scientist.

“It was a very exciting position, but raising four daughters

outside of the urban area of Philadelphia wasn’t what we wanted. The Midwest was a far better place for my family,” Brown said. So in October 1991 he applied for a teaching job at his alma mater. By January, he was teaching circuits and electronics courses at State.

CONNECTING COLLEGE WITH INDUSTRY

One of his commitments was that his students would leave with more than knowledge; they would leave with opportunities to work in South Dakota.

By July 1993 he was department head. One of his first acts was to establish an advisory board with industry leaders in the region.

“We were very disconnected with any of our stakeholders within the region. My first order as dean was to require every department to put together an industry advisory board. We needed to start having conversations with them if we were going to be producing the type of employees they needed.

“I’m really happy how those boards have matured. Now we’re very well engaged and connected with our regional employers,” Brown said.

‘IT’S TIME FOR ME TO MOVE ON’

Brown, who turns 65 June 8, believes “it’s time for me to move on. It’s time for someone new to come in with fresh ideas. When I became dean there were three driving reasons to become dean”—academic program expansion, upgraded facilities and better engagement with industry. “I feel like they’re all fulfilled.”

In retirement, Brown said his first focus will be spoiling grandchildren. He has six—three in Brookings and three in Volga. His other two daughters live in Sioux Falls and Boston. Also high on the list are traveling with his wife, riding on his Harley-Davidson, often with a son-in-law, and becoming more involved with their church in Toronto.

“My Christian faith has played a key role in my success and everything I have achieved has come with the blessings of Almighty God. I’ve truly been blessed,” he said.

Dave Graves

GIVING OPTIONS



Dean Lew Brown decided that One Day for State funds would go toward student groups, such as the Quarter-Scale Tractor Team shown here. One Day for State raised nearly \$31,000 for the Jerome J. Lohr College of Engineering. Photo courtesy of the American Society of Agricultural and Biological Engineers.

NO MATTER WHAT THE GIFT SIZE, *you can make a difference.*

That's a message that the SDSU Foundation works by as it rebrands, making the term "annual dues" a thing of the past.

A large form of donor outreach for the Jerome J. Lohr College of Engineering has been the Engineering Phonathon. One Day for State, an online campaign that debuted in 2017, is one way that the Foundation looks to raise funds differently. The campaign also has social ambassadors, who promote material to increase the digital footprint.

During the 24 hours of One Day for State, Dean Lew Brown decided donors could give to specific items, such as Engineers Without Borders, Quarter-Scale Tractor Team, Human Powered Vehicle and the Concrete Canoe teams. This approach differs from the Phonathon, where the funds go toward the college's highest needs.

"We can always strive to reach more donors," said Erin Glidden, the director of loyalty giving at the SDSU Foundation. "[This shows] we are not going to reach out to you just one time a year, we communicate with you throughout."

The compilation of One Day for State and the Phonathon allows the Foundation to reach donors more than one time a year. The campaigns, while different, both allow for the reach of different audiences. Despite a decline in donations, the Phonathon still remains as the front-running campaign.

In 2016, the Lohr College of Engineering Phonathon raised about \$185,000 with more than 1,000 donors. Unfortunately, 2017 saw only \$125,000 raised from 661 donors.

"Results of the Phonathon had been in decline," said Tom Becker, the college's development director. "People are becoming less and less willing to answer the phone because they think they will be scammed."

The contact rate of callers reaching their constituents used to be three to four attempts. Now it is taking as many as eight calls to reach potential donors.

Due to its history, the Foundation will continue the Phonathon.

Nearly 40 years ago, the Phonathon started in Wenona and Waneta halls, according to Barb Dyer, a former administrative assistant to the dean of the college. A person sat in the hall with a computer, inputting information from the callers in each room.

Over time, the Phonathon moved to the basement of Pierson Hall and to the building that was once the Bunny Wash and Testing Center, but the building has since been torn down. Now, PhoneJacks and engineering students make the calls from the Foundation basement.

Dyer said that the camaraderie and competition amongst students was some of the most fun parts of calling. But, there were some additional perks to making the calls.

"Alumni really like talking to students in their major. That was always a huge thing, and we always got a lot of job leads. A lot of leads they might not of gotten," she said.

With these different approaches, the Foundation looks to ensure a connection with generations of students across the board.

Throughout SDSU, the One Day for State campaign raised nearly \$300,000 within the 24-hour period. Of that total, 118 donors raised about \$31,000 for the college. There were 106 student donors who participated in One Day for State.

"Letting students on campus be a part of it, we let them know what the Foundation is and show them what we do," Glidden said.

Glidden said that with the One Day for State campaign, millennials were more likely to donate because it was primarily online and because the social media marketing reminds them. She said that results showed a large percentage of people were also more likely to donate through challenge matches.

Another One Day for State campaign is expected to be launched in early fall 2018. The Foundation hopes for continued success.

"One Day for State did better than we expected," Becker said. "You never know where those connections are going to come from."



STINGER
GHAFFARIAN
TECHNOLOGIES



Stinger Ghaffarian Technologies and the Jerome J. Lohr College of Engineering have entered a partnership that allows SGT on-campus space for its employees and interns. The space in Daktronics Engineering Hall also allows for interaction with students and faculty on cooperative research activities. Pictured at the grand opening ceremony are: from left, front row, Provost Dennis Hedge, SGT's Chris Haugen, Calvin Kielas-Jensen, John Hedman, Daniel Scholl and Steve Hietpas; back, Jason Werpy, SGT's Kevin Moe, SGT Douglas Jatton, Dennis Helder and Dean Lewis Brown.

ON-CAMPUS LOCATION

SGT OPENS OFFICE IN DAKTRONICS ENGINEERING HALL

While John Hedman knew the U.S. Geological Survey Earth Resources Observation and Science Center (EROS) was located in Garretson and had employees present at his school, Hedman did not plan on working there, much less before graduating from college. Thanks to an arrangement with Stinger Ghaffarian Technologies (SGT) and the Jerome J. Lohr College of Engineering, Hedman has already spent some time working at EROS as an intern for SGT, which supplies workforce for EROS.

Hedman, a Brandon native and computer science and mathematics major, is one of four students working as interns for SGT, which opened an on-campus location in Daktronics Engineering Hall in 2018. Kevin Moe '88, an IT solutions architect at SGT, and Jason Werpy, an adjunct instructor with the college, are full-time SGT employees in the office.

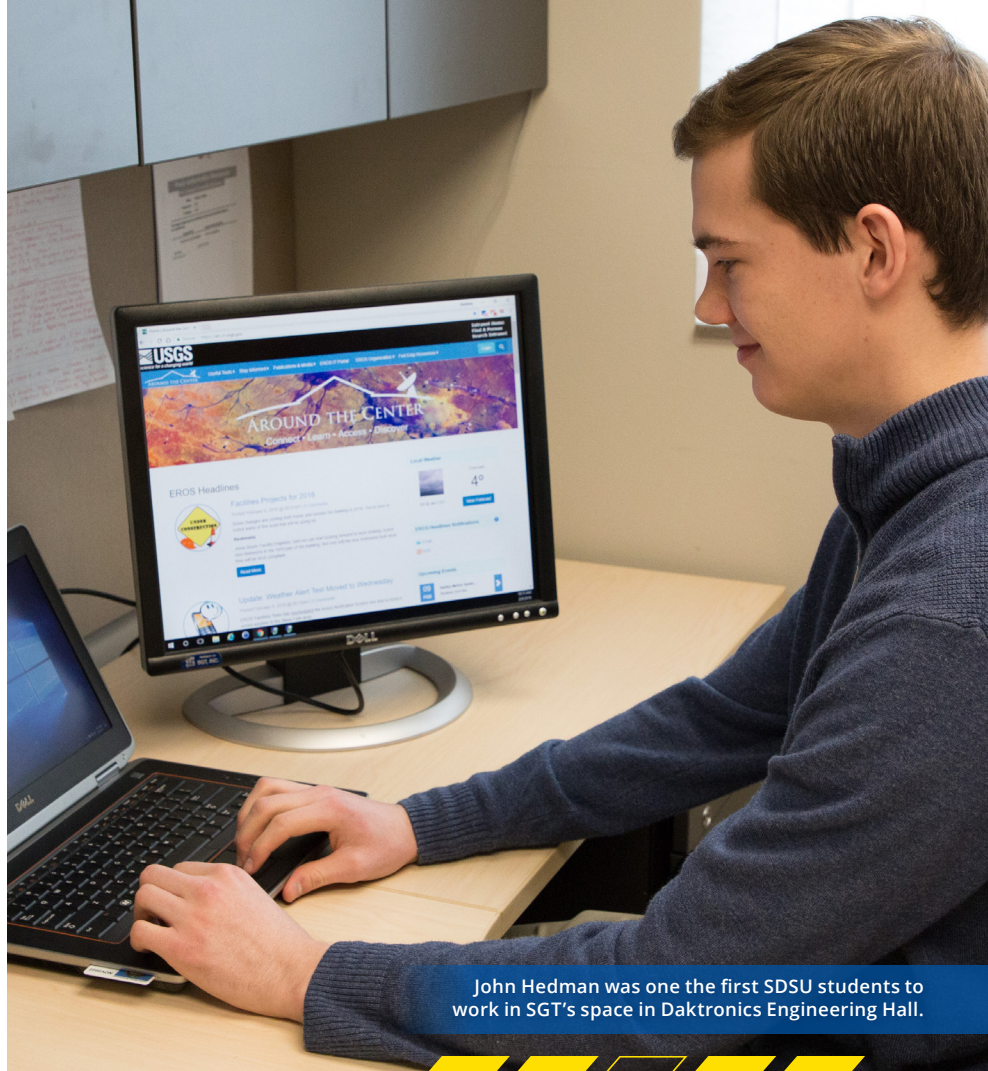
"It's really cool to be able to learn topics in the classroom and then go upstairs and apply what you've learned on real applications," Hedman said. I think it's really important for students to know how you're going to use what you're learning right away instead of wondering if you're ever going to use it in the real world. It's also a two-way street. I've learned a lot of things in school I use at SGT, and I've learned a lot at SGT that I can use at school, too."

Dennis Helder, the college's associate dean for research, said SGT and the college have worked together with the Image Processing Laboratory, from which SGT has hired eight current employees. In addition, SGT program manager Douglas Jatton said more than 20 percent of SGT's systems engineers, software staff and science staff have graduated from State.

"Some of the traits that SGT has observed in SDSU grads, and frankly in our staff from other great South Dakota universities as well, is a solid foundation of technical skills and capacity combined with a can-do Midwest work ethic," Jatton said. "In capacity, I am talking about coming out of school with the ability to think objectively, analyze options, collaborate and lead within teams, and then commit themselves to solving real-world problems. These learned behaviors start during their college experience, and I really want to stress that the college continues to emphasize technical communication and team-based development skills in the curriculum and in all senior design projects. Collaboration and working successfully in small, cross-discipline teams is what industry expects nowadays, and SDSU delivers on that requirement."



Jaton, program manager of SGT, left, and Daniel Scholl, vice president of research and economic development at South Dakota State University, prepare to cut a ribbon as part of the grand opening ceremony.



John Hedman was one of the first SDSU students to work in SGT's space in Daktronics Engineering Hall.

Even before the SGT office, Moe spent a lot of time on campus since graduating. He served on two advisory boards and is currently on the Dean's Advisory Council.

"Over the course of my 20 years of recruiting and working with the college, I saw the need to be closer to students. About four or five years ago, I started to see the trend where students wanted more of a relationship with a company," Moe said. "Coming in once or twice a year for a career fair didn't allow you to establish a relationship with the students. When I started at SGT, I presented Doug the idea of getting an office on campus, and he was open to it.

"Being here even a few days each month allows me to stay in tune with the activities going on on campus," he continued. "I know the leadership and most of the faculty. If they want to stop in and provide feedback or bounce ideas off me, that collaboration is what we're looking for ... it's already paid off being here after the first day this semester."

Moe said SGT could add interns at its on-campus location. However, SGT is interested in hiring more than just interns.

"The idea is to provide a pathway for students to full-time employment. I'm originally from South Dakota and I had to leave South Dakota when I graduated to find a job in my field," Moe said. "What I want to do for the students is try to provide them jobs so they don't have to drive 500, 600 miles away for a job or work on the coasts.

"If this agreement produces the results we expect, I don't see a problem with us keeping it open or even expanding," he continued. "EROS is a very well-kept secret; there are some amazing things going on there. As everyone knows, the business world is all about results so we'll experiment for a year or two and then adjust from there, but I can't see how this isn't going to work."

In late February 2018, SGT announced a definitive agreement with KBR. The deal still has to be approved by the U.S. Securities and Exchange Commission. Once the approval process is completed, SGT will be known as SGT, a KBRwyle Company.

Matt Schmidt



PAYING IT BACK

DGR ENGINEERING EMPLOYEES FUND SCHOLARSHIPS

Each year, nearly 1,000 new students receive Jackrabbit Guarantee scholarships. These \$1,000 scholarships are donated to the South Dakota State University Foundation by businesses or individuals. One regional engineering firm is taking its commitment to the next level.

DGR Engineering, which is headquartered in Rock Rapids, Iowa, and has offices in Sioux Falls and Yankton, along with Sioux City and Ankeny, Iowa, gives seven Jackrabbit Guarantee scholarships each year. While they may have the firm's name on them, the funds are actually donated by employees who decide to put the firm's name on the award instead.

"He [Blair Metzger, president of DGR Engineering] has worked hard to create that culture of philanthropy and that culture of giving within to SDSU," said Tom Becker, development director for the Jerome J. Lohr College of Engineering.

But Metzger doesn't take credit. He says that both of his predecessors as DGR Engineering president, John Madden and Bruce Jennings, worked to promote their alma mater.

"When I took over as president, they had been encouraging us to donate funds for scholarships," Metzger said. "The Jackrabbit Guarantee was just coming into play at that time, and it was

suggested that we do something as a group. We reached out to our SDSU graduates and put together the scholarships."

Starting with the 2007-2008 academic year, DGR Engineering gave its first Jackrabbit Guarantee to the SDSU Foundation. The annual scholarship gifts have since grown from \$1,500 to \$7,100. Twenty-three DGR Engineering employees have contributed to the Jackrabbit Guarantees. Metzger, a 1986 electrical engineering graduate, said giving back is one of the motivations behind the scholarships.

"Everybody has received help somewhere along the line, and those of us in the engineering community were fortunate to turn a good education into a good job," he said. "It's the least we can do to give back and make sure the next generation has the same opportunities."

DGR Engineering has about 60 engineers on staff, with about two-thirds of the group being Jackrabbits.

"In the past few years, we have continued to grow. We have hired more SDSU graduates, and they have helped increase the scholarship donations," Metzger said.

The seven Jackrabbit Guarantees are in the firm's different areas of engineering. Electrical, civil and environmental,



DATA SCIENCE SPECIALIZATION *CREATED FOR MATH MAJORS*

Data scientists are predicted to be among the most sought-after candidates in the labor force for the next decade.

With that in mind, the Department of Mathematics and Statistics has created a 30-credit specialization for undergraduate math majors. Department head Kurt Cogswell expects 50 or more students to choose this data science specialization within two years. The specialization will be available beginning this summer.

The South Dakota Board of Regents approved the proposal at its Dec. 6 meeting. Adding the specialization will not require any additional classes to be created.

By forming a specialization out of the existing curriculum, the specialization will appear on the students' transcripts. "That makes it a marketable credential in the same way that a bachelor's degree is marketable," Cogswell said. "Students can choose this specialization at any time during their first two years, including immediately at the beginning of their freshman year.

"The specialization will offer students an exceptionally strong undergraduate preparation in the field of data science that will prepare them either for direct entry into the workforce or for entry into competitive graduate programs in data science or related disciplines.

"In particular, it will allow students to transition seamlessly into SDSU's M.S. in data science program, which is now in its fourth successful year of operation."

Math majors are required to have 120 credit hours to graduate; 30 of them can be in the specialization. Sixty percent of the 120 credits are available online.

Specialization courses range from computer science II, a 200-level class, to applied Bayesian statistics and a host of other 400-level courses.

and agricultural and biosystems engineering each have two scholarships dedicated to these areas. The seventh is for water resources engineering.

"The scholarships are based on the areas where DGR Engineering has needs in hiring and maybe the same degrees the employees have as well," Becker said.

Becker said by awarding these scholarships under the DGR Engineering name, rather than the employee's, the firm increases its visibility to students looking to enter the workforce.

"The demand for engineering grads right now is very high," Becker said. "Those employers hiring students need to know how to differentiate themselves from others and this is one way to do that."

"It's good from a business perspective," Metzger said. "We need the pool of talent to hire for the work we do, and SDSU is a big part of that. We have had great success when hiring students from SDSU."

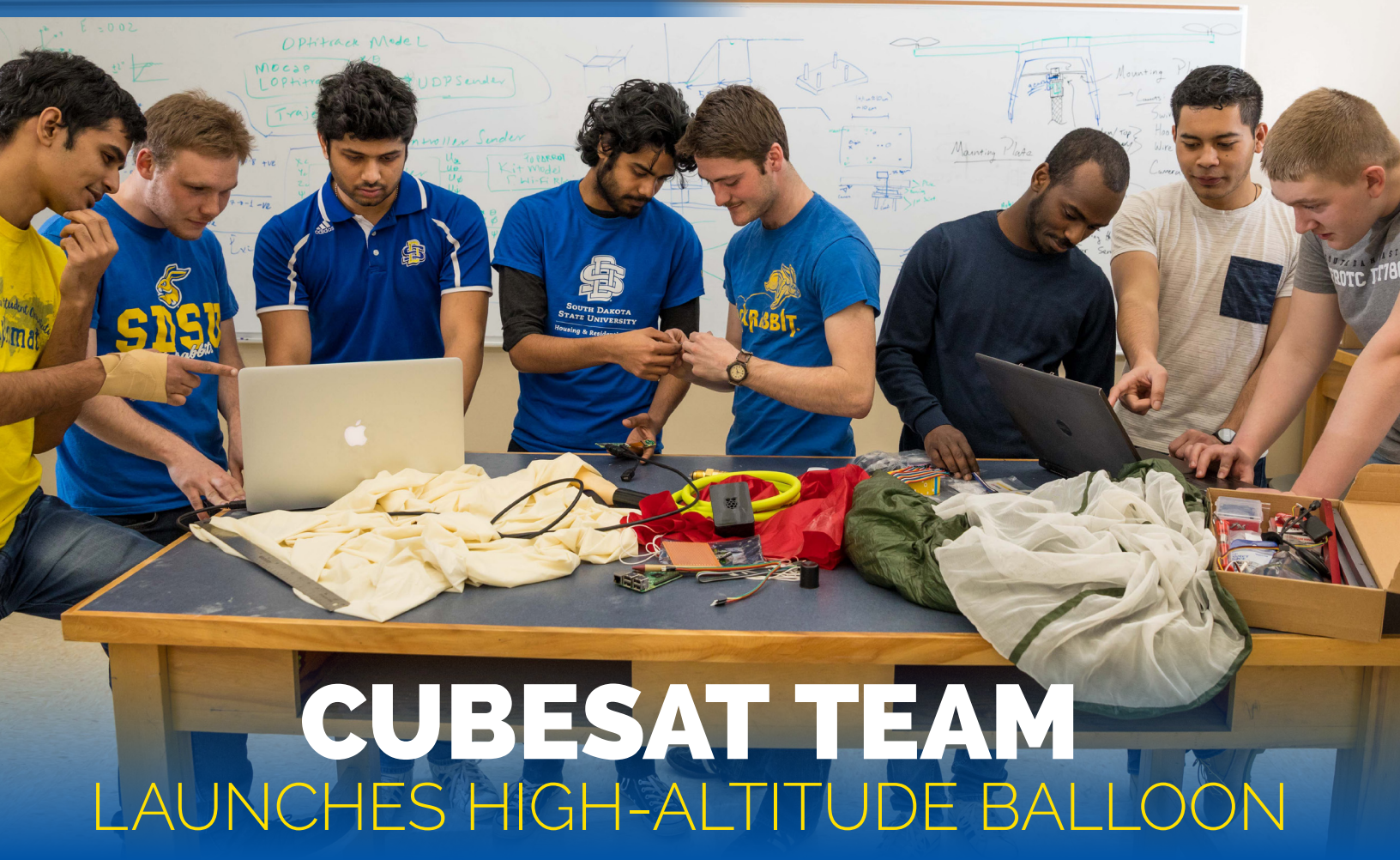
Becker said that DGR Engineering is one of the few places, if only, where employees create scholarships in their company's name, rather than their own. The engineering firm also gave \$100,000 toward the construction of Daktronics Engineering Hall to benefit the students who use the facility.

"SDSU is really important to DGR Engineering, and obviously it is to me personally, too," Metzger said, "SDSU produces good students who have a strong work ethic."

Heidi Kronaizl



Cubesat Team participants Dharshana Rajah, Jacob Nomeland, Rishard Rameez, Adrian Weerakkody, Kevin Lund, Kidus Guye, Hafidh Satyanto and James Sorensen prepare components and modeling for the high-altitude balloon launch.



CUBESAT TEAM LAUNCHES HIGH-ALTITUDE BALLOON

The CubeSat team is on a mission—to be the first South Dakota team to launch a small cube-shaped research satellite, according to CubeSat president Rishard Rameez, a senior mechanical engineering major from Kandy, Sri Lanka. The first step will be to launch a prototype using a high-altitude balloon during Engineering Expo April 20.

The club, which began in fall 2017, fosters interest and passion in aerospace engineering among graduate and undergraduate students, according to CubeSat adviser Marco Ciarcià. The assistant professor of mechanical engineering decided that SDSU needed a student organization dedicated to the design, development and construction of a CubeSat after attending a small satellite conference. Ciarcià worked with small satellite guidance system design during a research fellowship at the Spacecraft Robotics Laboratory of the Naval Postgraduate School in Monterey, California.

SDSU's team has 50 to 60 members, with 20 members actively working on the high-altitude balloon launch, according to Rameez. About 80 percent of its members are undergraduates. Members meet every Thursday from 1:15 to 2 p.m. in Crothers Engineering Hall Room 249. "Newcomers interested in becoming involved in CubeSat are always welcome," Ciarcià said.

Through the CubeSat Launch Initiative, NASA offers universities and nonprofit organizations the opportunity to design a research experiment that fits into a stack of

10-centimeter cubes, about 4 inches on each side, Ciarcià explained. The single-unit cube must weigh less than 1.33 kilograms, about three pounds. Once the experiment is designed the club will apply to have its small satellite payload launched into space for free.

"It's low-cost access to space," said Ciarcià. NASA's goal is to launch CubeSat missions from all 50 states. Since the program began nine years ago, 61 CubeSats have been launched and 150 CubeSat missions have been selected from 38 states and the District of Columbia, according to the NASA website.

"South Dakota is one of the states that has not done so," said Rameez. "We are building the expertise and gaining experience to launch that CubeSat."

PREPARING FOR BALLOON LAUNCH

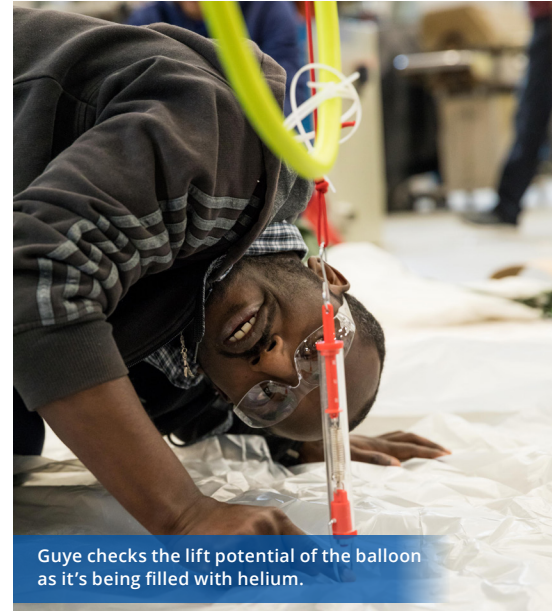
The CubeSat members working on the balloon launch are divided into five teams based on their interests: communication, structural design and integration, sensors, payload and altitude control. During weekly meetings, each team leader gives a progress report.

Sophomore James Sorensen, a mechanical engineering major from Watertown, joined CubeSat "to build something meant to operate in space." He is also in U.S. Air Force ROTC. At a February meeting, Sorensen, who is on the structural team, reported on regulations for high-altitude balloons. He recommended

The Cubesat unit launches successfully during the March 22 trial run. It was recovered near Olivia, Minnesota.



A camera in the CubeSat team's high-altitude balloon captured this image. During its 2.5-hour maiden voyage on March 22, the balloon traveled 90 miles and reached an altitude of approximately 90,000 feet.



Guye checks the lift potential of the balloon as it's being filled with helium.

getting clearance from Sioux Falls air control before launching the balloon, which prevailing winds might send to southwest Minnesota or northwest Iowa.

Graduate student Spencer Harwood, who is on the altitude control team, said, “You can calculate and study all you want, but to collect data from space is important.” The Brookings native received his bachelor’s degree in mechanical engineering in December 2017.

The CubeSat teams tested their prototype’s GPS system and sensor capabilities during a March 22 trial run. The science payload, which monitors radiation, was launched during Engineering Expo.

ENGAGING FACULTY MENTORS

While brainstorming ideas for a collaborative research project, Ciarcià and assistant professor Anamika Prasad came up with the idea of tracking the effect of space radiation on the mechanical and structural properties of bone. Prasad specializes in biomaterials, including assessing the effect of medical radiation to fight cancer on bone tissue.

“We are starting off on the journey through CubeSat; this is our master plan,” she said. For this research project, the CubeSat team will design an environmental chamber or biohousing “to keep the bone alive, meaning that the cells are active.”

Furthermore, the experiment does not return—the satellite orbit degrades and it burns up. Consequently, Prasad explained,

“The bone needs to talk to us.” Sensors will transmit information on the behavior, mechanical properties and composition of the bone, including a biochemistry analysis of the liquid in the bone.

These facets of the project open opportunities for students from disciplines, such as chemistry and biochemistry and electrical engineering, to become involved in CubeSat.

This academic year, two more mechanical engineering faculty, assistant professor Todd Letcher and associate professor Greg Michna, have gotten involved, securing a one-year, \$5,000 South Dakota Space Grant Consortium grant to support the SDSU efforts.

“We’re enthusiastic supporters of team projects,” said Michna, whose expertise is in thermal management. Letcher has been working with materials to do radiation shielding for about a year and is heavily involved with other undergraduate research projects.

“This project gives students experience with systems integration and communication,” Michna said.

“This hands-on experience will create excitement among our students and the study will build faculty expertise and credibility to attract sponsorship and funding,” Prasad said. However, she pointed out, “first we need to learn how to launch things into space.”

Christie Delfanian



BEST BIKERS IN THE NATION!

HUMAN POWERED VEHICLE TEAM WINS BOTH REGIONALS

By winning contests in California and Pennsylvania this spring, SDSU can clearly claim to be the nation's best Human Powered Vehicle team.

The mechanical engineering students completed the sweep of the Human Powered Vehicle Competition by winning at State College, Pennsylvania, April 13-15. The students won the West regional in Pomona, California, March 23-25. Both contests, as well as one in India, are sponsored as an E-Fest by the American Society of Mechanical Engineers.

SDSU scored 90 out of a possible 100 points to win the 16-team competition at Pomona. The second-place team, California State University, Northridge, had 81 points.

Competition was stiffer and deeper—44 teams, including five from institutes of technology—in the State College contest, according to Greg Michna, adviser of the SDSU Human Powered Vehicle team and an associate professor of mechanical engineering. As a result, SDSU's margin of victory was much narrower—81.84 to 79.25.

"We weren't quite sure going into the announcements if we had won," said Michna, noting the team was confident of victory at the West Region.

Eric Looyenga, the team captain, said, "It was really nerve-wracking because we didn't know if we had won or not. It was definitely a relief when we won. We were very happy. The (1,300-mile, 23-hour) trip home (by van and car) went by real quick. It feels amazing. We put in so much work all year and it paid off at the end. It's cool to see how far we've come in four years."

TEAM MAKES BIG STRIDES

SDSU first entered the competition in 2015, Looyenga's freshman year. In 2015 and 2016, SDSU only entered one competition, finishing 17th and 23rd, respectively. By 2017, SDSU had a highly motivated crew and finished second and third. Many of the 20 members on the 2018 team returned from 2017, including Looyenga.

Teams are scored in four areas: Design, innovation, men's and women's sprint races, and the 2 ½-hour team co-ed endurance race.

In sprint competition at State College, SDSU women won first and Akron placed second. The SDSU men placed second with Akron first. In innovation judging, SDSU placed fourth while Akron was third. In design competition, SDSU gained an edge, placing first while Akron was seventh, giving the Jackrabbits a 25.06 to 20.35 point advantage in that contest.

ENDURANCE RACE DETERMINED CHAMPION

So the contest would be won or lost in the endurance race, a 2 ½-hour event on a 1.275-kilometer course in one of the stadium's parking lots.

The endurance race, which includes parcel pickups, hairpin turns, speed bumps and rumble strips, saw Akron University place second with 40 laps while SDSU was fifth with 36 laps. "The guys spent an hour and a half creating a spreadsheet showing how close to Akron we would have to finish in order for us to win (overall)," Michna said.

Team captain Eric Looyenga said, "All through the race we're asking 'Where's Akron?' We had to make sure we were keeping up with them."

SDSU's entry, dubbed FlapJack, started slow as it performed parcel pickups, but State had its "ringer" for the third of five riders. Alex Gray, an experienced endurance bicycle racer and a member of last year's race team, "got us all the way back to sixth place" as he completed the maximum 16 laps, Looyenga said. He then got behind the handle bars and moved SDSU into fifth place.

The final rider, Cole Sullivan, kept the trailing field in the rearview mirror. "The first four teams were difficult to catch," Looyenga said.

STUDENT PRESENTERS ALSO PLACE

At the Pomona contest, SDSU won the innovation category and the women's sprint, placed second in men's sprint and endurance, and placed third in design.

Reflecting on the season, Michna said the students "did a lot of hard work. They work really well together as a team. They started with design and contacting sponsors as soon as school began," Michna said, noting the cost of travel exceeds the \$3,500 cost of constructing the bike from scratch.

In addition to the races, four students competed in the Old Guard Oral Presentation, a 15-minute speech and five-minute question session on a technical project. Peder Solberg won in State College and Claire Eggleston was second in Pomona.

Dave Graves

YOUTH CAMPS

2018

ENGINEERING EXPO & PHYSICS BOWL

April 20, 2018, 9 a.m. – 3 p.m.
Swiftel Center, Brookings

CONTACT: (605) 688-4161, sdsu.engineering@sdsu.edu,
www.sdsu.edu/jerome-j-lohr-engineering/engineering-expo

SUMMER SCHOLARS

July 9-13, 2018
SDSU campus

CONTACT: Fathi Halaweish, fathi.halaweish@sdsu.edu,
(605) 688-4269

ACE (AEROSPACE CAREER AND EDUCATION) CAMP

July 8-11, 2018
SDSU campus

Contact: Cody Christensen, acecamp@sdsu.edu,
(605) 688-4983,
www.sdsu.edu/consumer-sciences/ace-camp

ELECTRICAL ENGINEERING CAMP

July 22-28, 2018
Daktronics Engineering Hall

CONTACT: Cory Mettler, 605-688-5306, cory.mettler@sdsu.edu,
www.sdsu.edu/electrical-engineering-and-computer-science/south-dakota-state-electrical-engineering-camp

BEST ROBOTICS

Oct. 27, 2018
Swiftel Center, Brookings

CONTACT: Becky Pistulka, Becky.Pistulka@sdsu.edu
or (605) 688-4161, www.sdsu.edu/jerome-j-lohr-engineering/jackrabbit-best-robotics

READY, SET (SCIENCE, ENGINEERING, TECHNOLOGY)-GO!

Nov. 3, 2018
Crothers Engineering Hall

CONTACT: Rich Reid, richard.reid@sdsu.edu,
(605) 688-4161, sdsu.edu/engr/camps/ready-set-go.cfm

TEAMS (TESTS OF ENGINEERING APTITUDE, MATHEMATICS AND SCIENCE)

Feb. 21, 2019
Lewis & Clark Room, University Student Union

CONTACT: Becky Pistulka, becky.pistulka@sdsu.edu
(605) 688-6792

EASTERN SOUTH DAKOTA SCIENCE AND ENGINEERING FAIR

Mid to late March, 2019
Club 71, Dana J. Dykhouse Stadium

CONTACT: Brad Blaha, bradley.blaha@sdsu.edu,
(605) 688-5133,
www.sdsu.edu/science-and-engineering-fair

GEMS (GIRLS, ENGINEERING, MATHEMATICS AND SCIENCE)

March 23, 2019
Crothers Engineering Hall

CONTACT: Rich Reid, richard.reid@sdsu.edu,
(605) 688-4161, sdsu.edu/engr/camps/gems.cfm

PROGRAM DESIGN CHALLENGE

March 28, 2019
University Student Union

CONTACT: Jerry Cooley, jerry.cooley@sdsu.edu, or
(605) 688-6618; Myounggyu.Won, Myounggyu.Won@sdsu.edu,
(605) 688-5703 Council



SOUTH DAKOTA STATE UNIVERSITY

Jerome J. Lohr College of Engineering

Students built structures made out of various school supplies and cups to be judged in the Engineering Olympics Feb. 21.



ENGINEERING WEEK

The annual National Engineers Week took place Feb. 18-24 and students across campus at South Dakota State celebrated the occasion with various events.

Brooklyn VanDerWolde, a member of SDSU's National Engineers Week planning committee, said that she thought National Engineers Week at the school went great and the planning for the events started last semester.

The National Engineers Week celebration dates to 1951 when the National Society of Professional Engineers started it to recognize the impact of engineers on the world. The week spreads information on past and recent accomplishments in the engineering profession.

The events began Feb. 20, with an engineering trivia game in the University Student Union's Market Square where students

answered questions to win prizes. Any student, regardless of their major, was allowed to participate.

The next event was an Engineering Olympics in Market Square. The participants were tasked to create structures made of objects such as cups, plates, pencils, tape and various other products. The contestants had to finish each task within time limits and these creations were then evaluated by judges. All participants received a prize.

The final event was the Ultimate Engineer Contest, sponsored by the Society of Women Engineers, Feb. 23. Four contestants were judged in categories that included personal talent, professional attire and a questionnaire. The judges said that it was a very close competition and all the contestants did well.

MINNEMUDAC 2017

Four SDSU graduate students won the AcumensAward at MinneMUDAC 2017, an annual data science competition in Eden Prairie, Minnesota, Nov. 4.

SDSU Grad Gold, which consisted of Ericka Readel of Fridley, Minnesota; Ashik Sahani of Dharan, Nepal; Eric Stratman of Yankton; and Monica Velakturi of Chittoor District, India, won the award for having the most technically appropriate and accomplished team presentation. The team competed in the advanced graduate division, analyzing real patient data from 40,000 diabetes patients from a four-year period, predicting which patients would likely become high cost in the following year.

The competition is sponsored by MinneAnalytics, a nonprofit organization dedicated to serving Minnesota's data science and analytics community. Data science professionals from different colleges, companies and planning committee volunteers run the event.

Thomas Brandenburger, an associate professor in the Department of Mathematics and Statistics, said the team had just one month to review the data on the patients and prepare its presentation.

"The team reviewed every pill the patients took, every claim they made, every diagnosis they received," Brandenburger said. "It was a few million rows of convoluted health-care data that had been de-identified."

Judges reported the SDSU team was "well prepared and did a great job working together as a team," according to Brandenburger. The members each received \$200 as part of winning the Acumen Award.

A total of 60 teams, including another SDSU team, competed in three divisions.

Gerald Peden



The contestants introduced themselves at the beginning of the Ultimate Engineers Contest. Engineering student Austin Etrheim won first place for the second time in two years. Peder Solberg finished second, Katelyn Kubasek, third; and Ng Jin Hang, fourth.



The audience also participated in games throughout the competition, such as trivia and cup stacking.

Emily Meerdink, a senior engineering student and vice president of the Society of Women Engineers, said this is the third year the SWE has participated and they plan to take part in future celebrations.

"Every year I'm always impressed and always surprised," Meerdink said.

Sophomore Makiah Stukel, a mechanical engineering student, participated in National Engineers Week and said her favorite event was the pageant. She also enjoyed seeing the different majors unite.

"I was looking forward to seeing all the engineers come together and support each other as a family," Stukel said. "You see a bunch of different people participate that you may not see in your classes."

Megan Fiala, the secretary of SDSU's Joint Engineering Council, said this was an opportunity for the students in the various engineering fields to come together and celebrate.

"It's something that doesn't happen a lot, so I think it's cool that we can all get together and be proud of being an engineer," said Fiala. "National Engineers Week is a time for us to all be together and say 'What we do is important, and we're proud of that.'"

Gerald Peden



NOT BUDGING!

SDSU TEAM WINS REGIONAL GEOWALL COMPETITION

Competing for only the second time in a regional GeoWall competition, a group of five civil engineering students won a regional contest at the University of Minnesota Feb. 24.

Sponsored by the American Society of Civil Engineers, the same folks who organize concrete canoe and steel bridge-building contests, the GeoWall contest has been going on since 2015. In 2017, SDSU sent an exploratory team to the contest, according to adviser Allen Jones, a professor in the civil and environmental engineering department.

In 2018, team captain Ben Hogen embraced the project and led an experienced quintet of civil engineering majors back to Minneapolis.

“OUR SUCCESS AT COMPETITION DEMONSTRATED THE STRENGTH AND ABILITY OF THE CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT HERE AT SDSU.”

-Team captain Ben Hogen

“The second goal (of the contest) is to have fun. The first goal is to develop technical skills and that’s exactly what Ben did,” Jones said. The wall students build is a mechanically stabilized earth retaining wall using lightweight poster board for the face of the wall and kraft paper strips for internal reinforcing of the paper. It fits inside an 18- by 26-inch plywood box.

One side of the box has a removable panel. When that panel is removed, the wall is not allowed to deflect more than three-quarters of an inch, Jones said.

The SDSU team’s wall didn’t budge a bit, he said. The key to victory was prestressing the internal kraft strips by tugging on them a little bit as they filled the box with sand. “No other team did that and only a couple teams had walls that deflected less than three-quarters of an inch,” said Jones, whose expertise is in soil mechanics.

PERFORMS AS DESIGNED

Hogen, a senior civil engineering major from Sioux Falls, said, “Our team was fairly confident in the stability of our wall design. Since the main objective is to use the least amount of reinforcement, the wall was designed with just enough strength to remain stable. This did not allow much room for error and definitely caused a few tense moments.”

The strength of the wall is further tested when students are required to fill a 5-gallon bucket with 60 pounds of sand.

The team’s entry had stood up well in this phase during testing, but Hogen noted the exact composition of the sand was not specified in contest rules, so the team had to make an educated guess. It guessed right. The wall stood up to the added weight.

Students had to submit their design in January and build according to that design. “The trial-and-error method is not allowed. That’s not how engineers work,” Jones said. He did say the students meticulously practiced constructing their design, staying well into the evening many nights working in the geotechnical engineering lab.

SECOND SDSU TEAM ALSO COMPETES

Hogen said, “I really enjoy competitions like this because they allow a group of people to learn from one another and deepen their understanding of a mutual passion. Winning the competition provided a confidence boost in ourselves and each other, especially because the other teams represented such internationally recognized programs.

“Our success at the competition demonstrated the strength and ability of the civil and environmental engineering department here at SDSU.”

His teammates were Matthew Warejcka, a junior from Platte; Josh Nelson, a junior from Stillwater, Minnesota; Austin Frosig, a junior from Cloquet, Minn.; Ted Sjurseth, a junior from Granite Falls, Minn.; and Emma Martin, a freshman from Madison. All are civil engineering majors. They walked away from the contest with a gold trophy in the shape of a sand cone, an apparatus frequently used to test soil compaction in the geotechnical engineering discipline.

A second SDSU team comprised of Alec Zimiga, Jared Rothmeier, Gunnar Kern, Matthew Buenger and Jordan Twedt placed seventh.

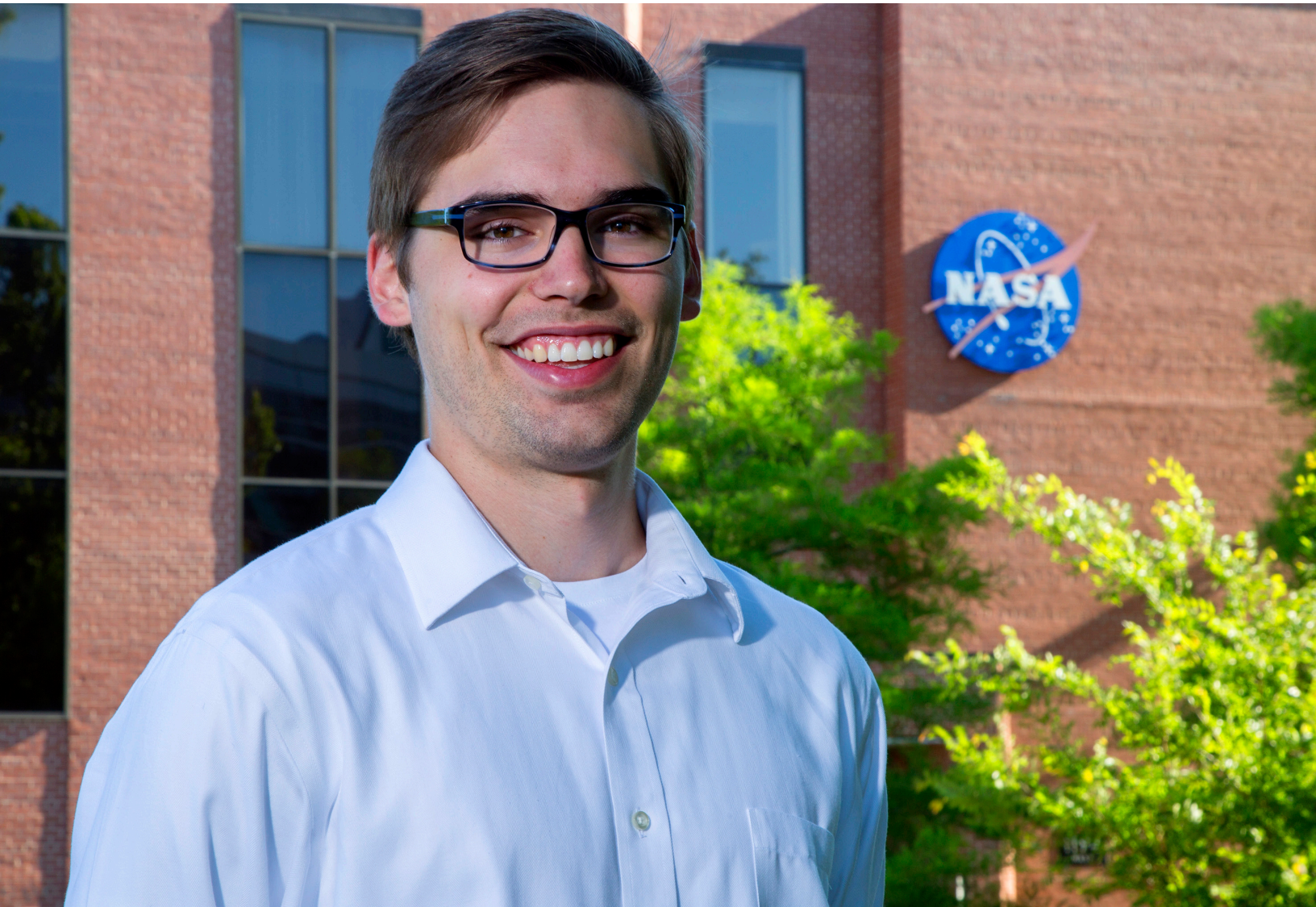
In addition to the Feb. 24 contest, all of the SDSU students attended the 66th Annual Minnesota Geotechnical Engineering Conference the day before, also on the University of Minnesota campus. There the students were granted access to a wide range of technical presentations and the opportunity to network with area professionals.

SDSU’s winning effort doesn’t qualify the team for the national contest because those teams were selected in advance based on design reports.

Dave Graves



Team captain Ben Hogen holds the GeoWall trophy after SDSU won a regional competition at the University of Minnesota Feb. 24. Teammates are, from left, Austin Frosig, Josh Nelson, Ted Sjurseth and Matt Warejcka.



SPACE GRANT AWARDS

LAUNCH PUETZ TO NASA INTERNSHIPS, OTHERS TO EDUCATIONAL GRANTS

Summer 2017 was a “dream come true” for Andrew Puetz, then a senior mechanical engineering major from Clear Lake.

He spent 11 weeks with 12 other interns from around the nation doing research for the National Aeronautics and Space Administration at Langley Research Center in Hampton, Virginia. The dream continued with a nine-week internship this spring, also at Langley, which dates to 1917 as America’s first civilian aeronautics laboratory.

Puetz’s dream of being part of NASA doesn’t go back that far, but it is “something that captivated me when I was growing up,” he said.

The thoughts of being an astronaut shifted as he moved deeper in high school science courses. “The stories of the space program really motivated me; something about NASA and the science. My dream job would be working for NASA in space technology. If we

get to go to Mars, working on technology for people living on Mars would be really neat,” said Puetz, who will be looking for a job after his spring internship. He graduated in December.

These internships were available to Puetz because of funding through the South Dakota Space Grant Consortium, which is supported by NASA.

The consortium’s mission “to instill the spirit of exploration and discovery in students, educators and in the general public” is partially achieved through the awarding of educational grants and fellowships. In fiscal year 2017, the consortium provided 87 scholarship awards worth \$231,000 to students from seven South Dakota universities.

Twelve of the 87 awards were to 10 SDSU students, all but one in the Jerome J. Lohr College of Engineering. (NOTE: list is on page 19). There were 195 applicants statewide.

SOUTH DAKOTA SPACE GRANT CONSORTIUM AWARDS 2017-18

(All are educational stipends unless otherwise noted.)

- Christopher Begeman, sophomore, electrical engineering, \$2,500
- Katrina Burckhard, freshman, electrical engineering, \$1,000
- Vanessa Konynenbelt, sophomore, electrical engineering, \$5,000 for the summer 2017 Davis-Bahcall Scholarship Program, \$1,500 educational stipend for the school year
- Kinsey Kurtenbach, senior, mechanical engineering, \$1,500
- Emily Meerdink, senior, civil and environmental engineering, \$2,500
- Andrew J. Puetz, senior, mechanical engineering, \$7,500 for summer 2017 NASA internship at Langley Research Center, Hampton, Virginia; \$5,500 for nine-week spring semester internship at Langley
- Nathan Remmich, sophomore, mathematics, \$2,500
- Kelly Sutko, senior, biotechnology and chemistry major, \$5,000 research stipend
- Ryan Twedt, \$1,000, sophomore, mechanical engineering, \$1,000
- Calvin Wampol, master's degree student in civil and environmental engineering, \$1,500

INTERNSHIPS: TEST FLIGHTS FOR DRONES

Puetz received two awards—\$7,500 for the summer internship and \$5,500 for the spring internship. Thomas Durkin, deputy director of the consortium, said Puetz “got this opportunity after we had already made our selection for other funding, but we were able to come up with \$5,500 and he accepted.” The offer was sent Jan. 2 and he began the internship four weeks later.

During this internship, he is “working under one mentor and another student. We are focusing on the control scheme and algorithms necessary to provide more stable flight abilities for a space launch system or Mars lander,” Puetz said.

Durkin explained that the system is the landing mechanism that dropped the one-ton Curiosity rover onto the surface of Mars in 2012.

While Puetz's spring internship was primarily computer time, his summer internship was largely hands-on. Formally, the project was titled “Unlinking of Multiple Autonomous, Unmanned, Aerial Vehicles Mid-Flight.” In essence, these were 18- by 18-inch drones—a hexacopter (six rotors) connected to a quadcopter on one side and another quadcopter on the other side.

Working in three teams of four, the interns did daily test flights to find the limits of these prototypes with some days ending with a broken propeller or copter's arm, Puetz said.

“This was very much making a test bed that this linkage process was possible and useful. Then a more professional staff could take in different directions,” he said.

In the short term, Amazon could use such a system for deliveries with the three-copter contraption leaving Sioux Falls jointly and then dropping off at various delivery points, Puetz explained. Much further out on the horizon are commuter pods large enough for people to ride in and detach as they reach destinations. A fixed-wing drone with solar panels also is part of the planning for future Mars exploration.

‘SUMMER I WILL NEVER FORGET’

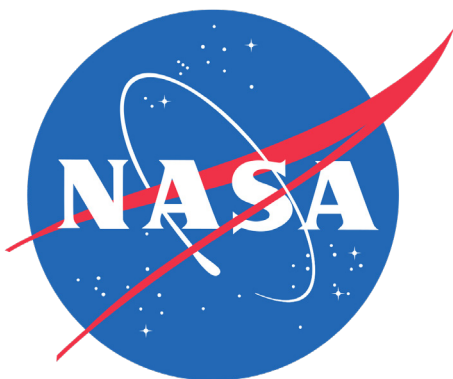
“I've had a lot of great summers—that was a summer I will never forget. We got up there early and came back late. We had a lot of fun pushing the copters to the limit. The NASA supervisors allowed us to do a lot of traveling also—to a Washington, D.C., satellite manufacturer, Wallop's Island, a satellite-launching site used by NASA and private companies, and a lot of tours of Langley and its aerodynamic wind tunnels.

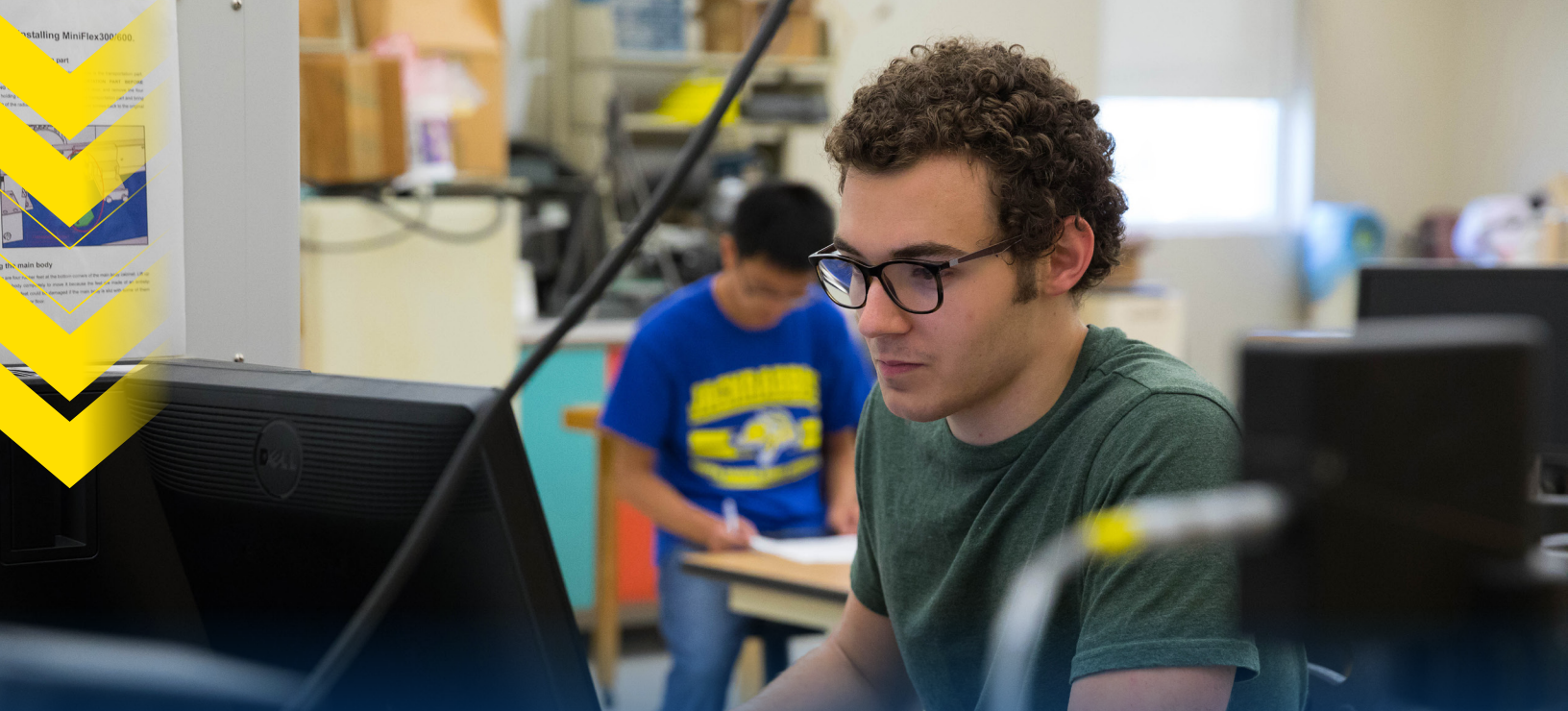
“There were a lot of us that wanted to be there as much as we could. It always felt special to go to work at NASA,” Puetz said.

Whether he experiences another dream come true by working at NASA as an employee remains to be seen, but he is thankful for the those who have given him the opportunity—his parents, SDSU faculty members and those who support the South Dakota Space Grant Consortium.

“I am extremely fortunate.”

Dave Graves





WAYBRIGHT BECOMES STATE'S 10TH GOLDWATER SCHOLAR

South Dakota State University student Jace Waybright was named one of 211 students to receive a scholarship from the Barry Goldwater Scholarship and Excellence in Education Foundation. Waybright, who is majoring in physics and mathematics, is SDSU's 10th Goldwater Scholar.

Waybright, who is also enrolled in the Van D. and Barbara B. Fishback Honors College, will spend this summer in Tsukuba, Japan, doing research at the National Institute of Materials Science. He is one of six undergraduates to participate in an international nanotechnology Research Experiences for Undergraduate (REU) program through Cornell University. The National Science Foundation-funded program gives young scientists global research experience.

He credited SDSU assistant physics professor Parashu Kharel with starting him on the path that led to these opportunities. "Dr. Kharel took a chance on me even before I came to South Dakota State—that made a big difference," said Waybright, who had already earned 30 college credits when he graduated from Lincoln East High School in Lincoln, Nebraska, in May 2016.

Before starting his undergraduate work at South Dakota State, Waybright worked with Kharel as a REU faculty-student pair at the Nebraska Center for Materials and Nanoscience in summer 2016 directed by professor David Sellmyer, a University of Nebraska, Lincoln, professor and director of the Nebraska Center for Materials and Nanoscience. That experience then led to Waybright receiving a subsequent summer REU paired with UNL assistant professor Xiaoshan Xu.

Waybright, who plans to earn a doctorate in physics and teach and conduct research in a university setting, knows there are benefits beyond the financial aspect of being a Goldwater Scholar.

"I plan to shoot very high for graduate school and having the Goldwater Scholarship is going to make me one of the more competitive applicants," he said.

Waybright has been working in condensed matter physics, which he described as a more physical approach to materials science. He has been reviewing certain magnetic behaviors that could have applications in future technology.

One example has been trying to find materials that could increase the accuracy and efficiency of the read head in a computer hard-disk drive. Another is the possibility of magnetic refrigeration.

Instead of using the current vapor-compression system in a refrigerator, the same process can be done using magnets.

"It would be much cleaner, and if we can find suitable materials, be more energy efficient, too," Waybright said. "We're not quite there yet. I don't know when we'll have magnetic refrigerators in households. It's still in preliminary stages. Searches are being done for which materials will work best while maintaining cost efficiency."

While Waybright admits he has been "decent" at science and mathematics from a young age, the process of conducting research drives him.

"Once I started doing research, I fell in love with the process," he said. "It's not just textbook answers—you're doing things that nobody knows, doing things for the very first time. It's very exciting and gives more of a purpose to your work."

The Goldwater scholarship provides up to \$7,500 for tuition and fees annually. The most recent Jackrabbit to receive the scholarship was Andrew Foley, who received the honor in 2016.

OTHER WINNERS ARE:

1993	Deron Arnold	2005	Ihab Halaweish
1994	Eric Held	2007	Daphne Moutsoglou
1997	Amy Fowler	2011	Sarah McMahon
2004	Jordan Williams	2011	Greg Tanner

Matt Schmidt

Save THE Date

CENTER FOR POWER SYSTEMS STUDIES

50TH *anniversary* CELEBRATION BANQUET

MONDAY
OCT. 1, 2018
SDSU ALUMNI CENTER

Check with the college in July for registration information.

INFO: Steve Hietpas | center director
Steven.Hietpas@SDSTATE.EDU | 605-688-4526

UPE HONORS

TWO STUDENTS

The international honor society Upsilon Pi Epsilon recently honored two computer science students for their academic accomplishments.

Matthew Gollaher, a senior from Hendricks, Minnesota, received a UPE scholarship after receiving a recommendation from his adviser, having a strong academic performance and making contributions to the computer science department and UPE organization.

Meng Wang, a graduate student from China, received the 2017 UPE Academic Achievement Award after a review of her academic record, extracurricular activities and adviser recommendation.

Gollaher, a 2014 Deubrook High School graduate, is the vice president of SDSU's UPE chapter and a member of South Dakota State University's Association of Computing Machinery Club. He was its president during the 2016-17 school year.

Gollaher said he was motivated for these leadership roles because of the opportunity to further develop himself as a computer science student.

"It's a nice club to be in for professional experience and getting the opportunity to network," Gollaher said.

Wang received her undergraduate degree in journalism at Tianjin Normal University in China. After working as a webpage editor, she came across computer programming work and found an interest in computer science.

Wang came to South Dakota State in 2014 and has been working toward her master's degree in computer science ever since. She became a member of UPE in 2017.

"It just felt so good because I knew I was lucky," Wang said. "I appreciated the recommendation from the UPE adviser."

After graduation in May, Gollaher would like to work in software development in Minneapolis. Wang plans on graduating in fall 2018 and would like to work as a software engineer in the U.S. before returning to China.

"Computer science, as a whole, is a challenging, but a very rewarding major to go through," Gollaher said. "Being involved in professional organizations like UPE or ACM is a fantastic opportunity to continue progressing on the difficult path."

Gerald Peden

ENROLLMENTS BY DEGREE (FALL 2017)

UNDERGRADUATE MAJORS (FALL 2017)	FEMALE	MALE	TOTAL	PERCENT
Ag & Biosystems Engineering	10	58	68	4.24
Civil & Environmental Engineering	38	196	234	14.61
Construction Management	14	157	171	10.67
Computer Science	22	210	232	14.48
Electrical Engineering	13	154	167	10.42
Electronics Engineering Tech	4	43	47	2.93
General Engineering	1	15	16	1.00
Operations Management	6	45	51	3.18
Mathematics & Statistics	53	82	135	8.43
Mechanical Engineering	44	434	478	29.84
Manufacturing (associate)	0	3	3	.19
TOTAL	219 (13.3%)	1397	1602	100

COMPARED TO	FEMALE	MALE	TOTAL
Total 2016	221 (13.4%)	1431	1652
Total 2015	186 (12.4%)	1311	1497
Total 2014	199 (13.5%)	1271	1470
Total 2013	189 (13.1%)	1249	1433

MASTER OF SCIENCE MAJORS (FALL 2017)	FEMALE	MALE	TOTAL	PERCENT
Ag & Biosystems Engineering	3	10	13	4.83
Civil & Environmental Engineering	5	39	44	16.36
Computer Science	20	26	46	17.10
Data Science	13	28	41	15.24
Electrical Engineering	5	23	28	10.41
Operations Management	6	8	14	5.20
Mathematics	3	11	14	5.20
Mechanical Engineering	4	34	38	14.13
Master of Engineering	1	12	13	4.83
Statistics	4	14	18	6.69
TOTAL	64	205	260	100

COMPARED TO	FEMALE	MALE	TOTAL
Total 2016	74	194	268
Total 2015	60	183	243
Total 2014	68	202	270
Total 2013	58	160	218

DOCTORAL MAJORS (FALL 2017)	FEMALE	MALE	TOTAL	PERCENT
Ag/Biosystems/Mechanical Engineering	6	7	13	23.21
Civil & Environmental Engineering	3	4	7	12.50
Computer Science & Statistics	2	12	14	25.00
Electrical Engineering	3	19	22	39.29
TOTAL	14	42	56	100

COMPARED TO	FEMALE	MALE	TOTAL
Total 2016	14	42	56
Total 2015	9	39	48
Total 2014	4	37	41
Total 2013	5	34	39

DEGREES CONFERRED (2016-17)

UNDERGRADUATES (7-1-16 TO 6-30-17)	FEMALE	MALE	TOTAL
Ag & Biosystems Engineering	0	14	14
Civil Engineering	4	38	42
Construction Management	1	39	40
Computer Science	4	27	31
Electrical Engineering	6	26	32
Electronics Engineering Tech.	0	6	6
Industrial Management	0	1	1
Mathematics & Statistics	19	19	38
Mechanical Engineering	7	58	65
Operations Management	0	6	6
TOTAL	41	234	275

MASTER OF SCIENCE MAJORS	FEMALE	MALE	TOTAL
Ag & Biosystems Engineering	1	1	2
Civil Engineering	1	12	14
Computer Science	2	5	7
Data Science	2	7	9
Electrical Engineering	4	12	16
Mathematics	1	1	2
Mathematics-Statistics Specialization	0	1	1
Mechanical Engineering	3	16	19
Operations Management	3	3	6
Statistics	3	2	5
TOTAL	21	60	81

DOCTORAL MAJORS	FEMALE	MALE	TOTAL
Ag & Biosystems & Mechanical	0	1	1
Electrical Engineering	1	4	5

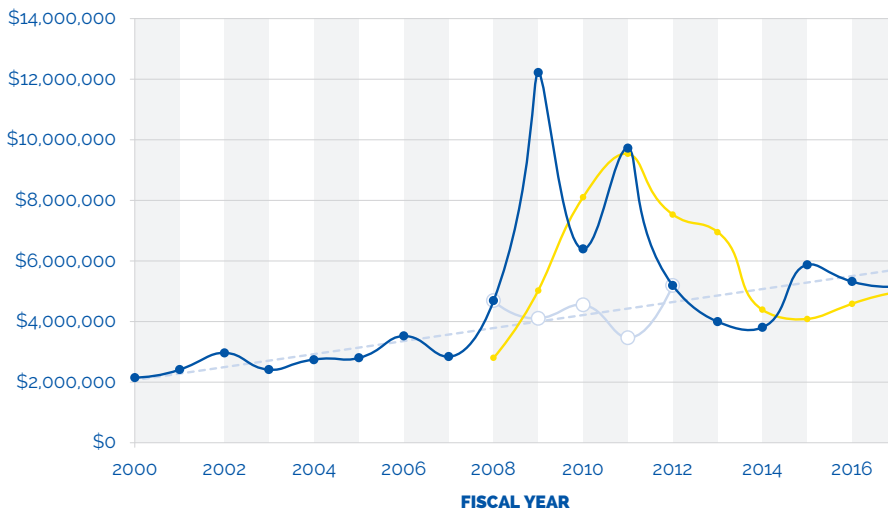
OTHER STATISTICS

JACKRABBIT GUARANTEE SCHOLARSHIP RECIPIENTS 2017-2018		
First Year:	\$ 487,215	200
Second Year:	\$ 313,100	142
Third Year:	\$ 219,000	96
Fourth Year:	\$ 225,900	73
TOTAL:	\$ 1,245,215	511

Average award per year: \$2,299
Total Undergraduate enrollment: 1,602

COLLEGE OF ENGINEERING FACILITIES	SQ. FT.
Agricultural Engineering	48,696
Crothers Engineering Hall	89,960
Daktronics Engineering	73,464
Solberg Hall	55,735
Architecture, Mathematics & Engineering Building	62,000

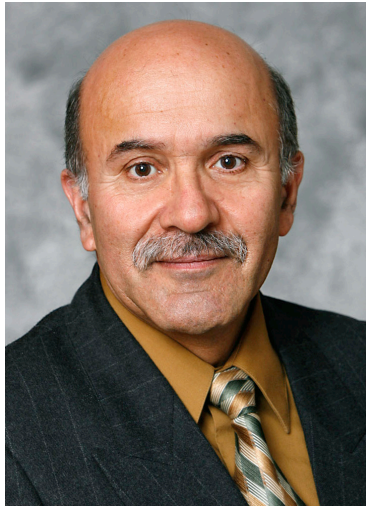
COLLEGE OF ENGINEERING EXTERNAL FUNDING



INTERNATIONAL UNDERGRADUATE STUDENTS		PERCENT CHANGE
Fall 2014	127	-
Fall 2015	217	70.87
Fall 2016	264	21.66
Fall 2017	213	-19

- COE External Funding w/o Earmarks
- COE External Funding
- Expenditures
- - - Linear (COE External Funding w/o Earmarks)

METLAB DIRECTOR DELFIANIAN RETIRING



Fereidoon "Fred" Delfanian has been connected to the mechanical engineering department since 1977 and on the faculty since 1980, except for a sabbatical to earn his doctorate.

Since 2006, the Iran native has been director of the METLAB (Material Evaluations and Testing Laboratory), in Crothers Engineering Hall. Thanks to \$5.5 million in Department of Defense grants obtained through earmarks by then-U.S. Sen. Tim Johnson, the facility became equipped with

an array of high-tech equipment.

The first DoD project involved a fatigue odometer sensor that would count the number of rounds fired and thus track the wear in a gun barrel, with SDSU providing nondestructive testing to support that.

If the fatigue odometer was focused on Delfanian, it would indicate there is a lot of useful life left. But "after 36 years of grading papers, I think that's enough," Delfanian said. So this spring's finals will be the last he grades. The father of three officially goes off payroll May 21.

FATHER OF METLAB

"Long after Dr. Delfanian retires, SDSU will still be benefiting from the extremely valuable equipment he helped bring to the department," said fellow faculty member Todd Letcher, who took classes under Delfanian, worked in the METLAB and in 2014 was hired as an assistant professor.

"After finishing my Ph.D. in 2012, Dr. Delfanian gave me a job as a postdoctoral researcher in the METLAB, where I would help complete testing for industry partners. Eventually, this postdoc position would turn into a tenure-track assistant professor position where much of my research still requires the use of METLAB equipment to understand the material characteristics of 3-D printed components.

"My own research, and many other research projects across the department and college, has greatly benefited from the equipment that SDSU was able to purchase during the original phase of the METLAB," Letcher said.

Delfanian said bringing the METLAB to SDSU was, in part, simply good fortune.

He had a friend in Chicago at American Science and Technology who was connected with defense contractors at Augusta Systems. They had received testing contracts and hired Delfanian to set up the lab at State. Delfanian worked two years as a subcontractor.

Defense department officials then suggested eliminating the middleman. Delfanian submitted a successful proposal in 2008.

"After 2008, we had control of the contracts and the lab," he said. That initial contract was for \$2.4 million. Another contract in 2010 was worth another \$2.4 million. The university also had \$700,000 from Delfanian's previous work as a subcontractor. American Science and Technology was retained to help with fatigue odometer work.

For his efforts, Delfanian was recognized as the college's Distinguished Researcher/Scholar at the Feb. 24, 2009, Celebration of Faculty Excellence ceremony.

The Department of Defense funding ended in 2012, but the lab has continued to stay active by providing materials testing services to industry and university researchers and students. Brookings businesses Daktronics, Twin City Fan and Larson Manufacturing are frequent customers as well as Marmen Energy, a wind energy manufacturer in Brandon, Delfanian said.

The Department of Defense released the equipment to SDSU under the provision that if it requests testing, the work would be done for free. In addition, Delfanian has received funding through two collaborative projects with the South Dakota School of Mines and Technology that provided about \$600,000 for testing to support the development of advanced engineering materials.

INTRODUCED STUDENTS TO FORMULA 1

In the days before METLAB, Delfanian's claim to fame was introducing the SAE Formula 1 racing car to the student body. Sponsored by the Society of Automotive Engineers, it is a contest pitting college students against one another in tests of speed, maneuverability and safety in cars they build from scratch.

Delfanian brought the idea to campus after learning about the competition and "the kids just jumped at it," he said.

"The students worked so hard to raise funds to build a car for competition. We didn't do well, but they (contest officials) admired us for participating," Delfanian said of that first effort in 2000. "But the students were exposed to what it took to compete. Now it is one of the biggest things in the mechanical engineering department.

"The students feel we are not less than any of the other competitors. It's really a big selling point for SDSU."

The car-building project was under Delfanian's oversight for three years. Now the faculty adviser is William Bluxsom, who says there are always one or two previous models on display in the AME building because it is such a big seller for the students and the prospective students. "And there never is a shortage of students to work on the car," he said.

'JUST WANTED TO SERVE'

Beyond the flashier parts of the job are the routine classroom duties—teaching design of machine elements (ME 421) as well as two sections of mechanical systems design (ME 478/479), the senior design capstone projects.

"My heart always was there for students. I just wanted to serve. When I see my students are successful, I'm happy. I focused

on what is important to students. They don't know what will be important. I do. They might not believe it, but when they are working in industry, they realize that we taught them the fundamentals.

"I got a call from a student a couple of weeks ago who makes six figures. Later on, I see the students and they appreciate what I taught them," Delfanian said.

PLAN B PROVED A GOOD CHOICE

As Delfanian prepares to leave SDSU, he reflected on how he got here.

He had completed his junior year of high school in Chalous and then went to Tehran for his senior year, hoping to be accepted by a national university. Competition was stiff for those slots and Delfanian was not accepted, so he looked at Plan B.

He then stayed on in Tehran another year to study English. After passing an English proficiency test, he went through the organization American Friends of the Middle East that certified he had met the requirements to be accepted at an American university.

Delfanian then went to the American consulate, got his visa and was headed to the United States to study engineering. However, the school that Delfanian enrolled at was not SDSU, but Northwestern College in Orange City, Iowa. He felt the small, private Christian college gave him a better opportunity to improve his English. After two years, he transferred to Iowa State.

He was in Ames for a year and in fall 1977 transferred to SDSU.

LEFT ONE DAY BEFORE TEHRAN AIRPORT CLOSED

After completing his bachelor's, Delfanian's intention was to go back to Iran and find work after serving in the army. But in October 1977, demonstrations against the Shah were underway in Iran. By Jan. 16, 1979, the Shah had gone into exile and Ayatollah Khomeini was soon in power. When Delfanian was home in summer 1978, his parents urged him to go to the U.S.

He left one day before the airport in Tehran was closed. Delfanian entered the master's program at State, graduating in

1980.

After his first year of grad school, Delfanian married Christie Steiger, a South Dakota farm girl he met in fall 1977 on campus. They had become engaged when she went home with him in summer 1978 after her graduation as a journalism major. A return trip to Iran wouldn't come for another 12 years.

In the interim, he was offered a job at SDSU (1980), the Delfanians began a family and his home country was subjected to tight sanctions by his new country.

FARGO FINE, BUT NOT HOME

From that point on, Delfanian had no intention of leaving SDSU long term. He spent 1987 to 1990 in Fargo, North Dakota, earning his doctorate and teaching part time. Fellow SDSU faculty members Dennis Helder and Kurt Bassett also were there for their doctorates and Delfanian said he was treated well at NDSU. But that didn't make him want to stay.

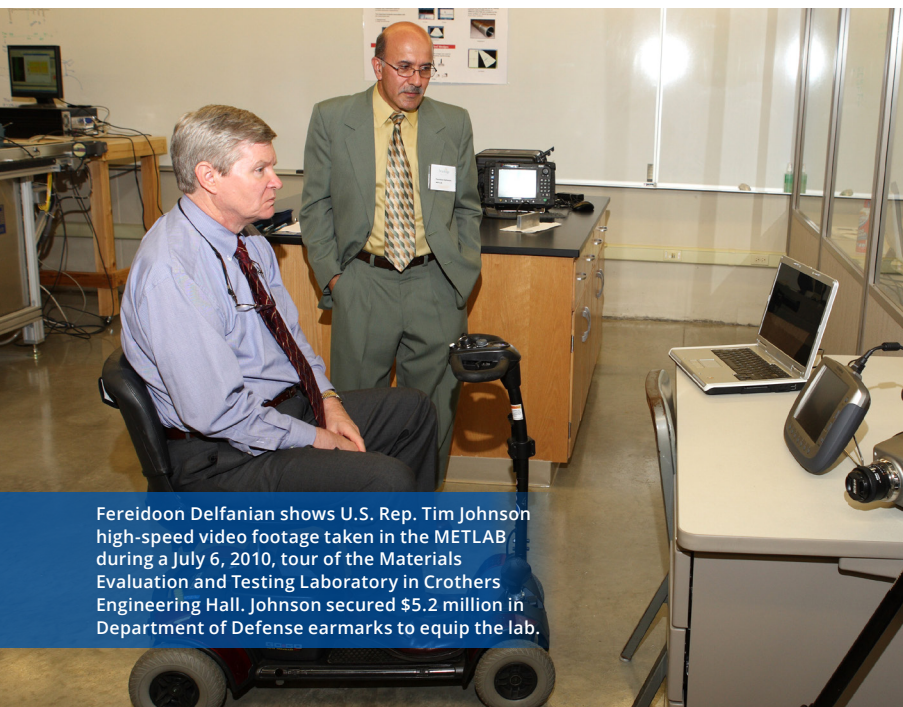
"We had a house here and an attachment here. Fargo was good, but it was always cold and the wind was blowing," said Delfanian, who became an American citizen in 2003.

Through the years, both his parents have died, but his eight sisters and two brothers remain in Iran. After retiring, Delfanian plans to visit Iran to help make decisions regarding his father's property, on which oranges, kiwis and rice are produced in an area near the Caspian Sea. "It's just like Florida," he said of the climate.

Other than that, his only retirement plans are to get a hunting dog and visit their children, who are scattered around the country.

Eldest son Neemah is a computer engineer in Syracuse, New York. Second son Reekah is a software engineer in Madison, Wisconsin, and daughter Shireen is completing her junior year at St. Cloud (Minnesota) State University.

Dave Graves



Fereidoon Delfanian shows U.S. Rep. Tim Johnson high-speed video footage taken in the METLAB during a July 6, 2010, tour of the Materials Evaluation and Testing Laboratory in Crothers Engineering Hall. Johnson secured \$5.2 million in Department of Defense earmarks to equip the lab.



Fereidoon Delfanian holds a small strand of line that was being tested for abrasion analysis in the METLAB in spring 2011 for an Iowa company.

NUMBERS DON'T LIE

42+67=RETIREMENT FOR ROE

During Thomas Roe's undergraduate days at State, the mention of statistics brought visions of batting averages, shooting percentages and yards per carry.

Today, there is a graduate program in statistics at South Dakota State with 23 majors in the master's program and 12 in the doctoral program with eight faculty members teaching graduate statistics. The senior member of that faculty group is retiring May 21. Thomas Roe, who joined the SDSU faculty in 1983, is marking the end of a 42-year career in mathematics and statistics.

The Brookings native, who earned his diploma from Brookings High School in 1968, found himself to be a natural when it came to mathematical formulas.

He graduated from South Dakota State in 1972 with high honors and was inducted into the Phi Kappa Phi honor society. Next stops were Laramie, Wyoming, where he earned a master's degree in mathematics (1975) at the University of Wyoming and East Lansing, Michigan, where he did coursework in statistics at Michigan State in 1975-76.

He also was teaching statistics part time at Michigan State, but the other part of the calculation was Mary, Jay and Julia.

By this time in his life, Roe and his wife, Mary, had a 16-month-old and a newborn. No matter how Roe worked the numbers, a part-time teaching salary didn't pay the bills. So he left Michigan State in August 1976 to work full time as an instructor at St. Clair County Community College in Port Huron, Michigan. Their third child, Inga, was born there in 1981.

BACK TO BROOKINGS

In 1983, Roe heard from one of his former SDSU instructors, department head Ken Yocom, who wanted to hire Roe to fill a sabbatical vacancy.

Roe took the offer and began a Jackrabbit stay that won't officially end until he finishes teaching an online class this summer. In 1986, Gregory, the fourth Roe child, was born in the Brookings Hospital. When he arrived, SDSU had "a very fledgling statistics program" that originated in Roe's junior and senior years of college under Bob Lacher, the faculty member who Dean Junis Storry had directed to develop a few statistics courses.

In Roe's first years on faculty, he primarily taught calculus, differential equations and advanced engineering mathematics.

It was in the late 1980s that Yocom asked Roe if he would be interested in teaching a statistics class. Up until this time, Lacher had taught most of the statistics classes beyond STAT 281 with Paul Evenson and Howard Nielsen teaching a few. With a minor in statistics at the University of Wyoming and the coursework at Michigan State, Roe decided he was well qualified.

SWITCHING TO STATISTICS

For many years, Roe split his teaching duties between mathematics and statistics. Then 10 to 12 years ago, department head Kurt Cogswell asked him to choose. Roe went with statistics. Since then he has been teaching upper-division undergraduate statistics and entry-level graduate statistics. His favorites are STAT 381, a course designed by Lacher, and STATS 382 and 482, courses designed by Roe and a couple colleagues for mathematics majors.

STAT 381 is a mostly applied course intended for engineering and science majors. STAT 382 is theory based and teaches the underpinnings of why applications work. Applications make up most of the content in the STAT 482 course.

With more majors requiring students to have a knowledge of statistics, the demand for those classes has increased. For STAT 381 alone, Roe and another faculty member now teach two sections in the fall, three in the spring and one online section in the summer.

He tries to use word pictures and stories to help students make the mathematical connection.

For example, there was a math convention in Toronto and Roe found poisson on the menu. And poisson (peu-ZON) came with an order of chips. That little tale segued to 18th century mathematician Simeon Denis Poisson, who authored the Poisson equation, part of the focus for that day's lesson.

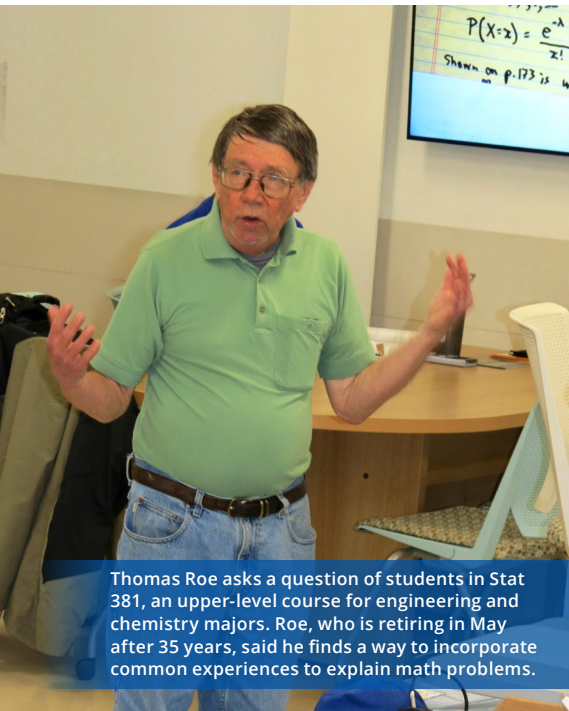
'GOES ABOVE AND BEYOND'

Mitra Devkota, who took a higher-level statistics class from Roe, nonparametric statistics, called him, "the most passionate stats professor I've ever had.

"He truly goes above and beyond to make sure students obtain the best understanding of the course content as possible. He has a selfless desire to teach and help others learn ... He paces his class extremely well, stays on task better than any teacher I've ever had, and promptly grades assignments, which are very well constructed."

Today, Devkota is trying to follow Roe's example. After getting his Ph.D. in statistics in 2014, he is teaching business statistics at the University of North Georgia.

Senior mathematics major Megan Aadland adds, "I appreciate how approachable he is. He genuinely wants his students to succeed. I utilized his office hours many times when I was in his classes, and he was always patient with me. He is great at explaining difficult concepts and is always willing to take the time to help you out.



Thomas Roe asks a question of students in Stat 381, an upper-level course for engineering and chemistry majors. Roe, who is retiring in May after 35 years, said he finds a way to incorporate common experiences to explain math problems.



Roe peeks over a computer projector while teaching in Stat 381. He said he has been comfortable in adapting to the new technology involved in teaching.

“Professor Roe tells many stories about his life experiences; he is an entertaining professor. He often uses his life experiences and current events to illustrate his points.”

Kory Heier, a junior mathematics major, adds, “I was a part of the first class to take STAT 382, which was taught by Mr. Roe. It was a brand-new course with a brand-new book and a brand-new professor (none of us had had Mr. Roe yet). He had an outline of what he hoped to accomplish at the beginning of the semester, but soon figured out that he would need to adjust the game plan.

“Whenever we ran into a rough patch of not understanding material, he had no problem breaking it down for us. He understood how important it was for us, the first STAT 382 class, to fully understand the material.”

While those are recent students, Roe has been a student’s teacher for years. In 1993-94, College of Engineering students voted him as teacher of the year. He called it “my most flattering moment” at SDSU.

FUTURE PLANS

As Roe exits university life, you can expect to find him in his garden and behind a book—his favorites are history books that explain how mathematical theories were developed.

The Roes do plan to stay in Brookings. His wife, Mary, retired from human resources at SDSU 10 years ago. They’ll also have an ear to the radio—son Jay has the midday, on-air shift at KBRK.

Dave Graves

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SOUTH DAKOTA ART MUSEUM:

www.sdstate.edu/south-dakota-art-museum

THEATER:

(State University Theatre/Prairie Repertory Theatre)

<http://www.sdstate.edu/theatre>

www.prairierep.org

Welcome NEW FACULTY



RONG FAN
STATISTICS INSTRUCTOR

Fan joined the college Sept. 21, 2017, teaching statistics courses such as SAS programming, R programming and statistical methods.

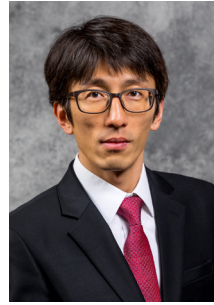
A native of China, she holds a bachelor's in mathematics education from Shanxi Normal University (2001) and a master's in probabilities and statistics from Beijing

University of Technology (2004). She has completed all but her dissertation for a doctorate in statistics from Southern Illinois University at Carbondale.

After completing her master's, Fan was a lecturer at Qingdao University of Technology and Shandong University of Science and Technology from 2004 to July 2012, when she left to begin her doctorate at Southern Illinois. She taught part time there while pursuing her doctorate.

She has found SDSU to have a friendly working environment with modern technology and a beautiful campus.

Fan and her husband, Zhao Yuan, have a daughter, Shuman Yuan, 9.



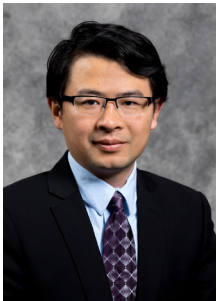
KWANGHEE WON
LECTURER IN COMPUTER SCIENCE

Won began his duties at SDSU Jan. 3 after doing postdoctoral research at the University of Nebraska, Lincoln, from March to December 2017.

He received his doctorate in computer science and engineering from Kyungpook National University in South Korea in 2013. His bachelor's and master's degrees also were from Kyungpook National in 2005 and 2007, respectively.

Won has been impressed with the beauty of campus as well as its large lecture rooms and his office in Daktronics Engineering Hall.

He and his wife, Eunjung, have three sons, Sion, 5, Sihyeon, 3, and Siyoun, a newborn. In his free time, Won enjoys playing racquetball, watching movies and playing video games.



YUE ZHOU
ASSISTANT PROFESSOR IN ELECTRICAL ENGINEERING

Zhou began his duties at SDSU Jan. 2 after working as a postdoctoral associate at Massachusetts Institute of Technology from February 2016 to December 2017.

He received his bachelor's and master's degrees in physics from Nanjing University in China in 2008 and 2011, respectively. He earned his doctorate in electrical engineering from Penn State in 2015.

He said he and his wife, Tianying Jin, and daughter, Yolanda Zhou, 4, have found SDSU and Brookings to be a welcoming place. In his spare time, he enjoys swimming and playing basketball.

2018 CAREER FAIR

Engineering companies fill Club 71 in Dana J. Dykhouse Stadium Feb. 6, 2018, for the Jerome J. Lohr College of Engineering Career Fair. The career fair also was held at the stadium in the fall. A total of 382 students visited with 95 firms during the 1-5 p.m. session.



WORK WHERE YOUR DEGREE MAKES A DIFFERENCE.



JILL MEYER, CSC02
ENTERPRISE DATA ARCHITECT

JON SPRANG, CSC08
ENTERPRISE TECHNOLOGY ARCHITECT

“My degree from SDSU helped me get my job at Daktronics, and Daktronics has given me the chance to grow and pursue opportunities aligning my skillset with the company’s needs, resulting in a great work experience.”

“My Computer Science degree from SDSU provided me with a solid foundation in mathematics, software engineering and database systems. It has helped in the planning and design of an architecture for Daktronics to leverage data for actionable insights.”



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DAKTRONICS

1968 – 2018

Faculty Awards

YOUNG INVESTIGATOR AWARD FOR THE LOHR COLLEGE OF ENGINEERING



Mostafa Tazarv, an assistant professor in the Department of Civil and Environmental Engineering; presented at the April 24 scholarship banquet.

Research interests for Tazarv include the behavior of concrete structures, advanced materials for civil infrastructure, accelerated bridge construction and large-scale testing. Prior to joining SDSU in 2015, Tazarv was a postdoctoral scholar at the University

of Nevada, Reno, where he received his doctorate.

Tazarv is currently principal investigator or co-principal investigator on more than \$1.2 million worth of projects. His past research led to the development of a new generation of

bridges that can be built faster, last longer, perform better in severe events and cost less in longterm.

The first shape memory alloy bridge in the world was constructed in Seattle, in which design and construction guidelines were based on his study on advanced materials. The unique aspect of this bridge is its continuous functionality after severe events with minimal damage and repair needs.

Furthermore, his large- and full-scale testing of bridges and buildings resulted in new design alternatives for the state of South Dakota and its local governments to save millions of dollars in bridge replacement, maintenance and performance.

He also invented a new connection for concrete structures to expedite construction and to quickly repair the structure after a severe event such as an earthquake or hurricane.

EDWARD PATRICK HOGAN AWARD FOR TEACHING EXCELLENCE



Donna Flint, a professor in the Department of Mathematics and Statistics; presented Feb. 20 at the Celebration of Faculty Excellence.

Flint received one of the two universitywide awards for teaching excellence.

She has dedicated the 18 years she has been at SDSU to student learning and success, according to Mary Kay Helling,

the vice provost for academic affairs, who carried Flint's nomination.

Flint, the assistant head in a department with 14 instructors and lecturers in addition to 22 tenure-track faculty members, said, "one of my biggest contributions to teaching at SDSU has been to nurture the instructors and lecturers in our department. Many of the things they do as standard practice come from things I originated in my own courses, suggested they try in their courses or helped them develop.

"They also know that if they have an idea for something new, I am always excited to listen, help them refine their idea and be their advocate should there be problems."

As for Flint's teaching, her course load includes real thinking, which is one of the most challenging courses in the program, yet she draws comments from students who appreciate the challenge and learning how to think.

Her fingerprints also can be found on quantitative literacy, an alternative general education course for students not needing college algebra; the senior capstone course, which she and colleague Dan Kemp have developed into a comprehensive course that develops mathematical research and communication skills pertinent in mathematics careers; and several innovative mathematically oriented Van D. and Barbara B. Fishback Honors College courses.

Other accomplishments include establishing the Math Help Center and the Computer-Based Mastery Program for developmental mathematics.

JEROME J. LOHR COLLEGE OF ENGINEERING

TIMOTHY NICHOLS AWARD FOR EXCELLENCE IN UNDERGRADUATE ADVISING



Gregory Michna, an associate professor in the Department of Mechanical Engineering; presented Feb. 20 at the Celebration of Faculty Excellence.

A universitywide award, it was given to Michna for his detailed and conscientious approach to advising, which has resulted in retaining and graduating nearly 100 percent of his 75 advisees since he joined the faculty in 2009.

In addition to academic advising, Michna served as faculty mentor for six students in the National Science Foundation-

funded S-STEM and OMEGA scholarship programs. He has been faculty adviser for 16 capstone design teams in the last six years.

Michna also serves as an engaged adviser to the SDSU chapters of the American Society of Mechanical Engineers and the Pi Tau Sigma honor society. He also advises the ASME Human Powered Vehicle team. More about that team's success is on page 12.

In addition, Michna participates in workshops designed to improve services to advisees.

OUTSTANDING RESEARCHER AWARD FOR THE LOHR COLLEGE OF ENGINEERING



Suzette Burckhard, a professor in the Department of Civil and Environmental Engineering; presented Feb. 20 at the Celebration of Faculty Excellence.

Burckhard has been involved in \$3 million in research during her 21 years at SDSU.

Most recently, she has been researching methods to improve engineering education, specifically

by studying various teaching techniques and how their use affects the retention of Native American and first-generation students and those from poverty and nontraditional backgrounds.

This involves working with the faculty at Oglala Lakota Tribal College in Pine Ridge and recruiting students from the two-year school as well as doing outreach to younger students in the community. Burckhard is the principal investigator for a nearly \$1 million grant from the National Science Foundation that funded SDSU's portion of the Pre-Engineering Education Collaborative, which also funds work in Hawaii, North Dakota and Wisconsin.

In South Dakota, the work involves collaborative work with Oglala Lakota, School of Mines and SDSU. The work, which includes summer camps, started in 2010. Funding was renewed in September 2016.

For her part, Burckhard has made it a priority to provide opportunities that encourage diverse students to become engaged in research. Through her research projects, she has mentored a postdoctoral scientist, two doctoral students, more than 50 master's degree students and numerous undergraduate students.

Prior research projects have covered reclamation and remediation of mining and industrial waste sites, quantification of the fate and transport of contaminants in the environment, investigation of basic hydrologic processes, quantification of mechanical properties of sustainable materials and topics in engineering education.

Burckhard holds degrees in engineering physics (bachelor's, 1986) and physics (master's, 1992) from SDSU and in chemical engineering (master's, 1993), a civil engineering (doctorate, 1997) and civil engineering (bachelor's, 2009) from Kansas State. She has been on the SDSU faculty since 1997. Prior to that she was a water quality fellow at Kansas State.

DISTINGUISHED ENGINEER

NATIONAL SECURITY SPACE AND INTELLIGENCE COMMUNITY LEADER



Fueled by a dream to become an astronaut and derailed by inadequate eyesight, Troy Meink developed into a leader in the United States Intelligence Community.

The 1988 mechanical engineering graduate serves as director of Geospatial Intelligence Systems Acquisition at the National Reconnaissance Office, 2 miles from Washington’s Dulles Airport.

He is responsible for a \$15 billion budget that includes the design, acquisition, launch, deployment and operational support of all national geospatial intelligence satellite systems. Meink manages a government workforce of 200 and a support contractor and industrial workforce of several thousand.

Of equal importance, he is also charged with sustaining mission partner relationships between federal agencies and representing National Reconnaissance Office programs to Congress, the director of National Intelligence, the Department of Defense and the Office of Management and Budget.

It’s a job with high demands and high satisfaction, the 1983 Lemmon High School graduate said.

“What I am doing is making a difference in national security. One of the reasons I stay in the government is being able to be in a position that truly makes a difference for national security. The people are great. A lot of the people think like me when it comes to serving our country.

“Thirdly, I love an engineering challenge. It’s fun work. Essentially, I get to do some of the most leading-edge engineering in the world. Those three things make it really fun,” Meink said.

STARTED AS TANKER NAVIGATOR

His career began with five years as U.S. Air Force navigator on the KC-135 Tanker stationed in Grissom Air Force Base, Indiana, and included combat missions in Iraq during the first Gulf War.

Meink was selected for the prestigious Palace Knight program that allowed him to earn his master’s and doctorate in aeronautical and astronautical engineering at The Ohio State University (1995, 1999, respectively) as well as conduct research at the Air Force Research Laboratory at Kirtland Air Force Base, New Mexico.

During those years at Ohio State (1993-1999) he would annually make the arduous application for acceptance into the astronaut program, but would get the thanks-for-playing postcard.

In 1999, after completing his doctorate, Meink was offered the opportunity to go through the weeklong interview process, which included a tour of the Houston space facilities. His shortcoming was 20-250 vision. A year later he got notice that vision standards

had changed and Meink was qualified to renew his quest to be an astronaut.

However, before Meink moved ahead in the process, the Space Shuttle Columbia accident of Feb. 1, 2003, put everything on hold. By the time the process resumed, Meink had become too old to be eligible.

So he continued to advance in the field of space systems research and development.

“My career started with research. It’s gone back and forth between military and national intelligence jobs; from basic and applied research to building and managing operational satellite programs.”

PLANE PROJECT PRODUCED PLENTY OF DIVIDENDS

One of the lessons Meink learned early in his career is the value of hands-on experience.

In his case, it was building two airplanes while in college. One was an ultralight kit that another student had started and the other was a single-seat plane.

He did fly the plane, dubbed the Wild Hare, but not long after Meink graduated, liability concerns prompted SDSU to donate the plane to a Pierre museum, he said.

The biggest benefit came when he was asked to apply for the Palace Knight program, which was designed to bring more Ph.D.-trained engineers into Air Force research labs.

“The administrator asked if I had really built two planes. He said, ‘I’ve got all these applicants from MIT and Stanford with GRE (Graduate Record Exam) scores out of the roof, but no practical experience,’ Meink relayed. So while some of the MIT superbrains were part of his Palace Knight class, so was the ranch kid from Lemmon who first tried to build a plane at age 13.

He estimates the value of the scholarship at \$500,000. Not only did it cover all tuition and fees to earn his master’s and doctorate, he also was paid a salary.

WELL RECOGNIZED CAREER

Indirectly, it continues to pay his salary. His assignments have included a Pentagon assignment—deputy undersecretary of the Air Force for Space. As a member of the senior executive service, he twice received presidential rank awards.

In 2012, he received the Charyk Award at the National Space Club’s Goddard Memorial Dinner for his work to deliver overhead signals intelligence capabilities.

His passion for aviation and space also is reflected in the middle name of his son, Story, who is named after astronaut Story Musgrave, the only astronaut to fly on all five Space Shuttles, and his daughter Jenna, which means “little bird.”

His most recent passion is mentoring his kids’ robotics teams. Story qualified for the VEX World competition the last three years and Jenna qualified this year.

Dave Graves

DISTINGUISHED ENGINEER

GENERAL MILLS VICE PRESIDENT GREGG STEDRONSKY



During his college years, Gregg Stedronsky spent summers and holiday breaks shaping tin for duct systems and roughing in plumbing lines as an employee of his father's business, Stedronsky Hardware of Wagner. His "office" was the shop of the third-generation business or a crawl space beneath a house in the small southeast South Dakota town.

Today, Stedronsky goes to work in the multilevel, glass-

walled headquarters of one of the nation's leading consumer food corporations at Number One General Mills Blvd., Golden Valley, Minnesota. Since 2007, he has been a vice president at General Mills, which had net sales of \$15.6 billion in 2017.

He currently serves as vice president of global engineering and safety for General Mills, where he has accountability for capital program execution, technology commercialization, and safety and environmental leadership.

While Stedronsky hasn't been personally doing technical engineering for many years, he said he still considers his position a technical one. Applying judgment to projects and providing technical leadership is an important part of his job. He said he feels fortunate that his career has in many ways been a natural extension of his small-town roots.

"Growing up in a family-owned hardware, plumbing and heating business in Wagner, South Dakota, you certainly feel a part of the ag economy. At General Mills, I still do. We're part of the nation's food supply. Many of the types of things we did in the store I still do today—just on a much larger scale."

JOINS GENERAL MILLS IN '91

Stedronsky started at General Mills in 1991 and held a variety of positions in manufacturing, engineering and plant leadership. The 1984 mechanical engineering graduate was a project engineer, maintenance team leader and engineering manager in production facilities in California and Illinois.

In 2001, Stedronsky became the director of control and information systems, leading the development of plant floor information systems to improve manufacturing efficiency.

He was named director of packaging engineering in 2004 and introduced vision-guided robotics to improve packaging performance and lower costs on several product lines.

As promotions took him farther from the production floor, he said he still found value in his degree.

"A mechanical engineering degree provides a basis to create understanding between many different stakeholders. The ability to conceptualize and communicate clearly with various groups of people is key to being an effective mechanical engineer," he said.

Stedronsky was promoted to vice president of engineering in 2007 and focused on reducing project timelines and improving system startup performance as well as guiding the corporate capital plan of \$600-\$800 million annually in partnership with the company chief financial officer.

BECAME MILLION-MILE TRAVELER

In 2010, he assumed responsibility for global safety and environmental programs. Workplace accidents have since been reduced by 50 percent and safety performance is now approaching world-class levels.

During this time, he transitioned the organization to a global engineering structure with regional offices in Shanghai, China; Sao Paulo, Brazil; and Nyon, Switzerland; to support the global growth of the corporation.

In his travels, he has found "engineering to be an international language. In any part of the world, the ability to solve problems and find creative solutions brings people together. We're working to support businesses that are growing around the world. When engineers come together on a technical issue, or develop an idea into a solution that works they're speaking the same language," Stedronsky said.

His career began as a manufacturing intern at Magnetic Peripherals in Aberdeen. He also worked in computer development for Control Data Corp. in St. Paul, Minnesota, before joining General Mills.

AN SDSU FAMILY

In 1987 he earned a Master of Business Administration degree from the University of Minnesota in operations management.

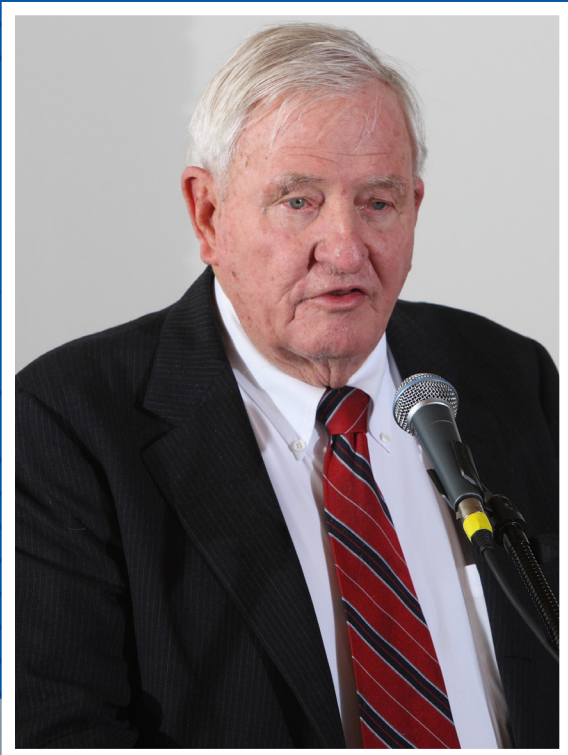
Stedronsky, of Chaska, Minnesota, and his wife, Kathryn, a 1985 early childhood development graduate of SDSU, have three children—Adam, Evan and Blake.

Other SDSU grads in the family are his father, Joe '50, business economics; uncles Vernon '54, mechanical engineering, Jerry Broz '57, electrical engineering; brother Grant '88, mechanical engineering; and sister Jill '93, nursing.

"I thought that a mechanical engineering degree from South Dakota State would be a perfect fit with my past and help create a great future. I'm lucky. It has really turned out that way," Stedronsky said.

Hohbach,

BENEFACTOR OF COLLEGE, SDSU



Harold Hohbach, a Palo Alto patent attorney with the heart of an engineer, died Dec. 28, 2017, at his Atherton, California, home.

Hohbach, 96, a 1943 electrical engineering graduate who grew up in the Depression studying by kerosene light in the family's Plankinton farm house, remained loyal to his alma mater even though most of his adult years were spent in Silicon Valley.

His endowment to the Department of Electrical Engineering and Computer Science created the Harold C. Hohbach Endowed Professorship in Electrical Engineering, the college's first endowed professorship. That title was bestowed upon David Galipeau at a Nov. 10, 2011, investiture. In 2016, following Galipeau's retirement, the title passed to Qiquan Qiao.

Hohbach's other long-lasting contribution to campus was the restoration of the Bummobile, the university's iconic 1912 Model T.

RESTORER OF BUMMOBILE

That story dates to 2008.

According to a column written by Chuck Cecil in *STATE*, the SDSU alumni magazine, Hohbach and his mechanic, Hensel Troche, hauled a 1911 Model T pickup back to Brookings, entered it in the Hobo Day parade, and gave it to the South Dakota Agricultural Heritage Museum.



Harold Hohbach (in passenger seat) rides past the art museum on Medary Avenue in the 2008 Hobo Day parade in the 1911 Model T pickup that he had refurbished and then was donating to the South Dakota Agricultural Heritage Museum. That led to him restoring the Bummobile.

Cecil wrote: “Folks at the SDSU Foundation and the Office of Student Affairs were so impressed with the refurbishing work that they asked if he’d take the Bummobile back to his California shop for a restoration. He agreed.

“At the time, I figured I might have to spend \$20,000 on fixing all that was wrong with it,” Hohbach said. As he and his mechanic delved into the old machine’s innards, that \$20,000 guess went out the windshield.

“But Hohbach isn’t one to cobble together or do something halfway. At 87, he’s a perpetual motion machine, managing his various business interests, and for the past eight months, keeping tabs and helping where he could on the meticulous rebirth of the Bummobile that had arrived on campus a year before he did.

“We completely rebuilt an engine and found a 1912 rear end,” he said. “We also procured new wheels and tires and found original brass kerosene side and rear lamps and a brass horn.” Every part, stem to stern, has been refurbished, including new wooden framing.

Galipeau’s investiture ceremony was held in the Hobo Day Galley in the University Student Union, where the Bummobile is housed when not on the road.

A FOREVER GIFT

Hohbach also was a major donor to the Solberg Hall renovation project, which was completed in 2003. That work transformed a vacated 1901 building into a state-of-the-art facility while maintaining its historic exterior.

Lew Brown, dean of the college, said, “Harold had a great interest in education and a huge heart for SDSU. He understood the great significance of his funding the college’s first endowed professorship, which will never stop helping us to recruit and retain top-quality faculty members.

“Harold was also one of the hardest-working men I have ever met. When I called him to announce my retirement in 2018, he jokingly told me I still had at least 30 more working years left! I will miss him dearly, but I’m happy his name will go on forever in our college through his endowed professorship.”

LAW CAREER STARTS AT AGE 31

After receiving his engineering degree, Hohbach joined the Signal Corps of the U.S. Army, serving until 1946, when he drove to California and enrolled in the University of California, Berkley, gaining a bachelor’s degree in business administration. He then spent two years as trainee and sales engineer with Westinghouse Electric.

Hohbach then went back to school, earning a law degree from Boalt School of Law at the University of California, Berkley, in 1952.

That same year he joined Flehr and Swain law office, later to becoming Flehr, Hohbach, Test, Albritton and Herbert, practicing patent law in Silicon Valley throughout the greatest period of technology development in history. He practiced there until 2002, when he retired from law but continued to oversee significant commercial real estate developments.

Hohbach, the oldest of six children, is survived by his wife, Marilyn, a son, two daughters, their spouses, 11 grandchildren and three sisters. He is preceded in death by his two brothers and a daughter.

A memorial service was held Feb. 2 at Menlo Church in Menlo Park, Calif.

Dave Graves



Harold Hohbach, left, and Lew Brown show off a medallion Hohbach received at an investiture ceremony for the Harold C. Hohbach Endowed Professorship Nov. 10, 2011. In the background is the Bummobile, which Hohbach underwrote the refurbishing of in 2008.



JAMES H. GROMMERSCH '47 died Jan. 15, 2018, at the Mayo Clinic in Rochester, Minnesota.

The 95-year-old mechanical engineering graduate was born and raised in Brookings and returned here after his retirement from Ford Tractor Co.

After graduation, Grommersch began his career as a product engineer at Dearborn Motors, which was acquired by Ford Tractor Co., where Grommersch held a variety of positions until his final

promotion to assistant general manager – sales and marketing for Ford Tractor Operations Worldwide in 1973. He retired in 1981. He was selected as a Distinguished Alumnus in 1973.

He and his wife, Kitty, moved to Brookings in 1990 and had a winter home in Mandeville, Louisiana. Shortly before his retirement, he began to acquire farm land in Brookings County, where he developed shelterbelts and pheasant habitat. In 2016, he was recognized as Sportsman of the Year by Pheasants Forever.

Grommersch is survived by his wife of nearly 67 years, two sons, a daughter, four grandchildren, a great-granddaughter and a sister, June Helsper, of Brookings.



DENNIS RICHARD LITTLE '65 died July 14, 2016, at the West Chester, Ohio, Hospital.

Little, 73, of West Chester, and formerly of Brookings, was honored as a Distinguished Engineer in 1998. The mechanical engineering graduate joined General Electric Aircraft Engines in the engineering training program after graduation.

That was the beginning of a 34-year career that saw him rise to corporate

officer by 1989, when he was appointed vice president and general manager of the marine and industrial businesses and the engine services businesses. In 1995, he became vice president and general manager of the military aircraft engine business, where he served until retiring in 1999.

Among his honors was being inducted into the G.E. Aviation Propulsion Hall of Fame. Little also was recognized as a major donor at the 2009 dedication of what is now Daktronics Engineering Hall.

While he was born in Los Angeles, he attended Brookings schools, graduating from Brookings High School in 1961 and becoming an Eagle Scout here.

Survivors include his wife of 51 years, Mary (Mosher); two daughters, three grandsons and a sister.



A-G-E CORPORATION, of Fort Pierre, was named winner of the Category II Build South Dakota Award for projects from \$1 million to \$2.5 million for a scour protection and erosion repair project by Highway 63 in Corson County on the Standing Rock Sioux Indian Reservation. The award, given by the Associated General Contractors of South Dakota, was presented Jan. 15 at

its convention in Deadwood. Following the presentation, A-G-E donated the \$500 award to Feeding South Dakota. Pictured, from left, are Gerad Johnson (SDSU '10), project manager on the job; Gary Johnson, a part-time faculty member and company owner; and Andy Johnson (SDSU '10), who was named Young Professional of the Year by Associated General Contractors of South Dakota.

GRAD'S WORK ON HIGH-TECH WEATHER SATELLITE REMEMBERED



Iver Mickelson, '90/'95 mechanical engineering, has been remembered by colleagues he worked with in the creation of a new technology weather satellite.

Mickelson, originally of Sioux Falls, was working with Ball Aerospace in Boulder, Colorado, at the time of his death. Mickelson, 48, died May 31, 2016, as a result of a heart attack. The Joint Polar Satellite

System (JPSS-1) launched Nov. 18, 2017, at Vandenberg Air Force Base, California. In advance, plaques were presented to 17 families whose loved ones died prior to launch.

The plaque cited Mickelson, a manufacturing engineer with Ball, for "your diligent and dedicated support of the JPSS production effort."

Ball Aerospace designed and built the JPSS-1 spacecraft bus and the Ozone Mapping Profiler Suite instrument, integrating all five of the spacecraft's instruments,

performing satellite-level testing and providing launch support.

The JPSS-1 spacecraft bus was based on Ball's flexible and proven Ball Configurable Platform line of spacecraft designed for cost-effective, remote sensing applications. The JPSS-1 spacecraft bus was the 12th spacecraft built on Ball's core architecture, which has more than 50 years of successful on-orbit operations.

Mickelson previously worked at the U.S. Mint in Denver (1998-2006) and with the Department of Defense at Fort Meade, Maryland (1995-1998).

On hand to receive the plaque for Mickelson's family was first cousin Sherri Bell and her children, of Reno, Nevada. Mickelson never married. His survivors include his mother, Doris Mickelson, and his sister, Christine Mickelson, both of Sioux Falls. Among his surviving aunts and uncles are Carolee and Len Faanes, of Dana Point, California. They are the Bell's parents.

Doris Mickelson and other South Dakota relatives had intended to attend, but cloudy weather pushed back the launch nine days for the original plan.

Dave Graves



The sun begins to set at Vandenberg Air Force Base Nov. 13, 2017. Because of clouds, the satellite wasn't launched until Nov. 18. On board the spacecraft was a new technology weather satellite worked on by late SDSU alum Iver Mickelson.



JACOB OHNESORGE

Jacob Ohnesorge has been called “tenacious.”

That description not only describes his play as a center on the Jackrabbits’ football team but also his approach in the classroom.

The 2017 FCS winner of the Rimington Award, which is presented annually to the most outstanding center in all divisions of college football, Ohnesorge earned his bachelor’s degree in mechanical engineering and also completed 15 of 30 required credits of coursework toward a master of engineering degree. Now, he is looking to use that approach to earn a shot to play in the National Football League.

“It’s [playing in the NFL] always been a dream of mine,” he said. “I started thinking about it more seriously after the past couple of years.”

The Waunakee, Wisconsin, native came to South Dakota State after being recruited to play football. After stepping on campus for unofficial visits, he knew SDSU would be a good fit.

“I really liked the campus and the coaching staff ... also liked the well-known engineering program,” he said.

Engineering piqued Ohnesorge’s interest after an introduction class in high school. That direction didn’t change when he enrolled at State.

Professor Kurt Bassett served as Ohnesorge’s academic advisor. “When he takes on something, he is committed to see it through,” Bassett said. “Football is sort of a mathematical game. There’s a lot of strategy and quick thinking required ... it fits well with problem-solving processes we concentrate on in mechanical engineering.”



Most student-athletes schedule their undergraduate studies over five years to help alleviate the demands of being a student-athlete. Ohnesorge, a three-time member of the Missouri Valley Football Conference Honor Roll, didn't want to do that.

"When I first picked what I wanted to do, I wanted to graduate in four years," he said.

In fall 2014, Ohnesorge became an advisee to Bassett, who oversees all student-athletes in the department of mechanical engineering. He said some student-athletes in his department work to earn their master's degree during their years of eligibility, but not very often. He said this track has worked great for Ohnesorge so far.

"It worked out pretty well because he had a semester of eligibility left and by taking some graduate courses as a senior, he was able to get a head start on the master's degree."

Ohnesorge said he planned to take a minimum of 12 credits in the fall during football season. For the spring semesters, he took 15 to 16 credits with anywhere from two to eight in the summer. Not only did he have to balance his coursework and football, but he also completed internships with Daktronics during the summer, working on project management for its engineers. He said the required study time as a student-athlete helped teach him how to prioritize.

"It takes a lot of balance especially with engineering, it's a time-consuming major," he said. "They [academic advisors] taught us some good time-management skills."

Bassett said that like other mechanical engineering student-athletes, Ohnesorge not only could balance his time, but also was an outstanding student.

"It's really amazing to me how well they [student-athletes] manage all their commitments ... and do well to really excel ... doing it right is really important," Bassett said.

Now, Ohnesorge has taken his first semester off from engineering academics since 2013 to concentrate on football. He went to TEST Football Academy in Martinsville, New Jersey, in January to train for about two months.

"It [training] was kind of a full-time job," he said, noting he completed running, muscle and positional drills along with

weightlifting and offensive line exercises. "It's not as much as participating in teams, but more individualized. [This is] to get yourself in the best shape, to perform the best in front of the scouts."

Ohnesorge participated in the pro day at SDSU, working for a possible shot with the NFL.

He reflects on his Jackrabbits career with great pride. The Jacks qualified for the Football Championship Subdivision postseason every year and he started a program-record 53 consecutive games.

"It's hard to figure out one highlight with football," he said. "The program has come a long ways since I started here."

Winning the Dakota Marker and advancing to the FCS playoff semifinals were just two of the memories that stuck out. But football wasn't the only thing he enjoyed during his time at State.

"The [engineering] professors really made my experience great," Ohnesorge said. "A lot of them are very helpful if you need help answering things, and they care about you."

Now, Ohnesorge waits to see which path life will steer him next, whether that future is football or engineering.

"You never know with football. I can control what I can control, but I can't control whether or not a team gives me a shot," he said. "I know that if football doesn't work out I'm in a great situation already having my undergraduate degree in mechanical engineering and being halfway done with my Master of Engineering degree."

Bassett said a student can work on a master's degree for up to six years before course credits begin to expire. The master of engineering program is designed to be offered online. Online course offerings are being phased in over the next year or so. However, Ohnesorge is not tied down to Brookings to complete his degree if he were to continue with his football career. In the end, Ohnesorge's choice of SDSU to continue with engineering and football, was a great decision.

"Choosing to come to SDSU has been the best decision of my life so far," he said. "Being a part of the football team and the engineering program, I wouldn't trade it for anything."

Heidi Kronaizl



"I ENJOYED MY TIME AT SDSU. BROOKINGS IS KIND OF MY HOME NOW."

When Dallas Goedert came to South Dakota State University, two things were very different from what they are now—his major and status on the football team.

The Britton native planned to major in mechanical engineering and hoped to become a part of the SDSU football team. After trying out as a walk-on, Goedert made the roster.

"I started off as a mechanical engineering major, and I walked on for football. I obviously wanted to play football at the collegiate level," Goedert said. "The NFL (National Football League) was a high dream. My high priority was getting a degree in mechanical engineering."

The tight end became one of three players in SDSU history to post consecutive seasons with 1,000 or more receiving yards. He stands fourth at State with 2,988 career receiving yards. A two-time Walter Payton Award finalist as the most outstanding offensive player in the Football Championship Subdivision, he was selected to play in the Reese's Senior Bowl, but did not compete due to a hamstring injury. With hopes to be drafted in the NFL's first round, he participated in both the NFL Combine and SDSU's pro day.

"I've been in Irvine, California, training. Usually, I lift for a few hours and do board work and interview prep. It's basically a full-time job out here between lifting, running and board work," he said.

Training professionally and performing in front of all 32 NFL teams was not an easy task. However, it was carefully planned. When Goedert was a sophomore, he decided to switch his major to operations management. Carrie Steinlicht, a senior lecturer in the Department of Construction and Operations Management, became his adviser. She said he didn't want to finish his education in five years like most student-athletes. He reached that goal, graduating in December.

"We had planned that he would have very little left in his last year ... to get ready for the combine, in particular," Steinlicht said.



DALLAS GOEDERT

Despite the strenuous student-athlete schedule, Steinlicht said that Goedert, and all of her student-athlete advisees, make sure they can attend class.

Not only was Steinlicht his adviser, but she also taught him in several classes. Production strategy, quality management, safety management and project management were all classes he took with her over the span of three years. She said he always had participated in class and met deadlines despite his busy schedule.

“They have designed athletic programs well enough so they [student-athletes] know what’s coming up,” she said. “Dallas is exceptional.

“He was pretty humble. We had a small class and he didn’t come in because he was injured. We were in class and everyone said, ‘Where’s Dallas?’ They didn’t know he was a No. 1 draft pick and how serious this was ... he’s not a bragger.”

Despite becoming an exceptional football player, Goedert’s education remained a priority from the start.

“I had a good grasp in the first year on what I needed to succeed. It prepared me for what I needed to do when I started playing,” Goedert said. “You can do any major and play football, but you need to learn when to study, what to study and to take advantage of the resources.

“It’s always good to have a backup plan. I know I can’t play football for the rest of my life,” he said. “Engineering is a good follow-up plan.”

Being a student-athlete alone can be hard, but Goedert started drawing local and national media attention as a junior. A few of his most notable catches made ESPN SportsCenter’s Top 10, the first being a one-handed touchdown catch against Drake in the inaugural game in Dana J. Dykhouse Stadium. As his career progressed and the NFL draft drew closer, the attention became bigger. Through all the media love, Goedert remains focused, calm and collected.

“Seeing all that [media] stuff is really cool, I would be lying if I said I didn’t look at it,” he said. “As soon as you make one mistake, all of that stuff is gone. You have to learn how to handle your emotions. Just got to keep going and do what you have been doing.”

Goedert says that both the campus and community hold a special place with him.

“I enjoyed my time at SDSU. Brookings is kind of my home now. All of my friends there are my family. It’s a great family atmosphere there,” he said. “I am proud of what I did there. Being from a small town and a walk-on, able to graduate in four-and-a-half years and with all the success on the field, it’s what you want to happen, but with high expectations.”

Heidi Kronaizl

DEAN'S CLUB

FROM JAN. 1, 2017, TO MARCH 15, 2018

Dean's Club membership consists of alumni and friends who have contributed \$500 or more annually to the Jerome J. Lohr College of Engineering. Dean's Club members are recognized as devoted friends of the college who make a significant impact on the college's future. They also will receive invitations to special college and university functions and updates from the dean.

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YOUR GENEROSITY MAKES IT ALL POSSIBLE

As you arrive at the last page of this publication, we hope you are filled with the same sense of pride we have about the amazing progress at the Jerome J. Lohr College of Engineering. After all, these accomplishments would not be possible without your commitment to SDSU.

Every article in this edition reflects a multidimensional partnership between our leadership, faculty, students, industry and our community, working closely to ensure quality education and experience to prepare our next generation of engineers, builders and data scientists.

This partnership has been in the works since the earliest days of South Dakota State College of Agriculture and Mechanic Arts. Engineering has always been an important part of SDSU. We plan on keeping it that way for many more years to come. However, we cannot do it alone.

We are extremely grateful to be in a region that understands the value of investing in the future of STEM (science, technology, engineering and mathematics) professionals. It is a privilege and priority to assist our faculty and students to bring you the greatest possible return on that investment, because the quality of our graduates depends on it.

Your financial support allows the Lohr College of Engineering to build a path to an amazing future and help our faculty and students achieve their highest aspirations. In his inaugural remarks, SDSU President Barry Dunn said, "I sincerely believe that imagination is the most powerful tool we have to achieve not only our personal dreams, but also the collective responsibility we have to each other and to the generations that await."

We value and appreciate everyone who invests your time, talent and financial resources to cultivate the next generation of South Dakota State engineers. The Jerome J. Lohr College of Engineering would not have the facilities, scholarships and programs without your generous support. Thank you for helping us make this goal a reality. Your continued support will be an important part of engineering's future at SDSU.

Tom Becker '81



“WITH THE NEW TAX LAW—WHAT ARE SOME SMART WAYS TO SUPPORT SDSU, NOW THAT THE RULES HAVE CHANGED?”

The passage of the Federal 2017 Tax Cuts & Jobs Act doubled the standard income tax deduction for the next five years. According to the joint Congressional Committee on Tax, the number of itemizers is expected to decline from 45 million Americans to just under 18 million, effectively making cash gifts to charities the least taxwise way to give.

Gifts of assets like tangible personal property (farm equipment, grain and livestock), appreciated land or securities, or utilizing innovative methods like directing your broker to swap a highly appreciated stock with a charity to reduce future capital gains exposure when you eventually do sell it, can have tremendous benefits for almost everyone. For those over age 70, they might want to take a page from SDSU alumnus Dale Stevens’ playbook.



Dale Stevens '62, B.S. Civil Engineering

CHARITABLE IRA ROLLOVER

Stevens '62 of Huntsville, Alabama, chose to use the charitable IRA rollover, or qualified charitable distribution (QCD), rather than writing a check to begin funding his endowed scholarship for civil engineering students active in U.S. Army ROTC. By using the charitable IRA rollover, he was able to satisfy his required minimum distribution without having to claim it as taxable income.

“It’s a way to put the money to good use,” Stevens said. “Providing scholarships to these students is a way of mentoring. My hope is these students will recognize the importance of supporting those that follow behind.”

Individuals age 70 ½ or older are able to gift up to \$100k from an IRA without recognizing taxable income. Additionally, for anyone who lives outside of the states of New York, Kentucky or Colorado, a QCD avoids “provisional income” that will likely save in Social Security and Medicare taxes.

This is not intended as professional advice. Consult with a qualified tax professional before making a charitable gift.

RANKING THE BEST ASSETS FOR CHARITABLE GIFTS

IF < 70.5 YEARS OLD

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2. Charitable Bailout (privately held C-stock)
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5. Cash

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3. Charitable Bailout (privately held C-stock)
4. Appreciated Stock or Land
5. Principal from IRA (up to \$100K/year)
6. Stock Swap
7. Cash

FOR MORE INFORMATION ON ANY OF THESE GIFT OPTIONS PLEASE CONTACT:

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COE CONSTRUCTION CHRONOLOGY

CROTHERS ENGINEERING HALL (REMODELING AND EXPANSION)

Cost: \$7.5 million (\$3.75 million private, \$3.75 million state)
Dedicated: Oct. 4, 2002

SOLBERG HALL

Cost: \$4 million (All in private dollars raised by the SDSU Foundation.)
Dedication: Oct. 10, 2003

DAKTRONICS EAST

AKA: Electrical Engineering and Computer Science Building
Cost: \$8.375 million (all private funds)
Dedicated: May 1, 2009

DAKTRONICS WEST

AKA: Phase II of the Electrical Engineering and Computer Science Building
Cost: \$4.4 million (all private funds)
Dedication: April 27, 2012

ARCHITECTURE, MATHEMATICS AND ENGINEERING BUILDING

Cost: \$17 million (\$7 million private, \$10 million public)
Dedicated: April 24, 2015