



Impulse

Jerome J. College of Engineering

South Dakota State University Fall 2015





Dear **ALUMNI AND FRIENDS,**

New building one of many causes for excitement

I write this just coming off another exciting Hobo Day weekend. We are honored that so many of our alums and friends of the college come back to visit.

We were particularly proud to show off the newest addition to the Jerome J. Lohr College of Engineering—the Architecture, Mathematics and Engineering Building, which we dedicated April 24 and moved into during the summer. Both students and faculty are excited to be in such a beautiful and functional space.

It's right across from Crothers Engineering Hall and adjacent to Solberg Hall. The two wings of Daktronics Engineering Hall are nearby as well, giving the college a quadrant of new or recently remodeled buildings.

I couldn't be more excited to see how the college's facilities have transformed in my years as dean.

If you haven't had a chance to tour the Architecture, Mathematics and Engineering Building—and even if you have—you will want to read the story on Page 2 of this issue.

It's a family tradition

State certainly doesn't resemble what it did when Conrad Solberg and Fred Rittershaus graduated in 1958 and Crothers was the new building.

One of the special qualities of State is its respect for tradition. As a college, we're gratified when that tradition is carried through families of graduates. Two great examples of that are the Solberg and Rittershaus families.

Conrad Solberg is the grandfather of two freshmen from the Twin Cities area following his footsteps to be Jackrabbits. And the young men's great-great-great uncle is Halvor Solberg, who started teaching at the school even before he graduated (1889/1891).

The Rittershaus connection doesn't go back to the 19th century, but it is pretty impressive. This issue has stories on both families as well as a look at the remarkable engineering pioneer Halvor Solberg.

High-achieving students

I admit to being a bit prejudiced, but I think our current students are truly remarkable as well. With the glimpse you get of them in this issue, I think you will agree.

Our enrollment includes student-athletes in virtually every sport SDSU offers. Many are leaders in both the classroom and athletic field.

One I particularly want to mention is Megan Waytashek. The all-conference basketball player was one of only five nationwide to receive a Tau Beta Pi Laureate Award. It's only the second time in the history of the college that an SDSU student has received the award and the first time was in 1983.

Many of our other students are succeeding in their engineering extracurricular activities—from racing teams to quiz bowl squads. The details are all inside.

Fascinating alums

The success stories of our alumni are truly endless. The ones we've included in this issue are fascinating:

- The ME grad who helped build the camera that photographed Pluto;
- The EE grad who is working with nuclear medicine technologies at Mayo; and
- The ME grad who is working with next-generation satellites while continuing to pursue his musical passion.

In memorial

Each year a college of our size experiences a fair amount of transition, including several retirements. This issue bids farewell to eight of your favorite faculty members and staffers.

In addition, the college was rocked this summer by the death of former staff member Kevin Dalsted, who died in a farming accident in Colorado. Kevin served the college for nearly 40 years in a number of roles and was an inspiration in each of them. We remember Kevin with two pages in the center section of this issue.

As I conclude, let me thank you for your support of the college. We encourage you to stay connected with your college, visiting whenever you can and following our activities on Facebook.

Lewis Brown, Ph.D.
Dean of Engineering

2015 DEAN'S ADVISORY COUNCIL

- **Jay Bender** '82, president, Falcon Plastics
- **Paul Bezdicek** '06, senior sales engineer, Ingersoll Rand Industrial Technologies
- **Jim Edwards** '82, assistant general manager of operations, East River Electric Power Cooperative
- **Daryl Englund** '72, retired president, Banner Associates
- **Jack Finger** '73, president/CEO, Sioux Corporation
- **Carla Gatzke** '84, vice president for human resources, Daktronics
- **Richard Gustaf** '73, chief executive officer, TSP
- **Kurt Hansen** '80, senior engineering manager, GE Aviation
- **Chuck Hendrickson**, president/CEO, CAPITAL Card Services
- **Al Heuton**, executive director, Brookings Economic Development Corporation
- **Brian Hoellein** '85/'88, vice president, Bartlett & West
- **Dale Jans** '74, president and owner, Jans Corporation
- **Gary Larson** '88, president, Electronic Systems Inc.
- **Allen Lee** '78, design engineer manager, Larson Manufacturing
- **Blair Metzger** '86, president, DeWild Grant Reckert & Associates
- **Kevin Moe** '88, second-line manager, IBM
- **Susan Moe** '76, retired planning and resource program manager, Federal Highway Administration (Minnesota)
- **Dana Nachreiner**, vice president of operations, Sencore
- **Rich Naser Jr.** '91, executive director, South Dakota Technology Business Center
- **Wanda Reder** '86 vice president, Power Systems Services Division, S&C Electric
- **Jon Rippe** '70, retired chair of the board, Bolton and Menk
- **Dan Rykhus**, president/CEO, Raven Industries
- **Mark Shoup** '95, manufacturing engineering manager, 3M Brookings
- **Gene Sieve** '90, managing principal, Burns & McDonnell
- **Gregg Stedronsky** '84, vice president of engineering, General Mills
- **Kathryn Walker** '81, managing director, OPENAIR Equity Partners

ABOUT THE COVER

Mathematics professor Dan Kemp helps a student use a calculator in one of the classrooms in the Architecture, Mathematics and Engineering Building. Kemp and other faculty are ecstatic about moving into the new building. See story Page 2.

Back cover—The fastest-moving 'float' in the parade was the Wild Hare Formula SAE team entry by the mechanical engineering department.

IMPULSE

is published twice annually by University Marketing and Communications and the Jerome J. Lohr College of Engineering, South Dakota State University, Brookings, S.D.

DAVID L. CHICOINE, SDSU president

ANDREA KIECKHEFER, publications editor

MATT SCHMIDT, editor

CHRISTIE DELFANIAN, DAVE GRAVES, KARISSA KUHLE, MADELIN MACK, EMILY WEBER, writers and photographers

VIRGINIA COUDRON, graphic design

SOUTH DAKOTA STATE UNIVERSITY

Office of University Marketing and Communications

Communications Center

Brookings, S.D. 57007-1498

(605) 688-6161

Impulse

Fall 2015



Features

2 A new home

Following dedication in April, several programs now are operating from a new three-story, 62,000-square-foot building.

6 Family tradition—Rittershaus

A third generation of Rittershauses is now pursuing an engineering degree at State.

8 Family tradition—Solberg

A new generation of Solbergs have enrolled at SDSU. They can trace a heritage all the way back to their great-great-great uncle Halvor Solberg.

11 Halvor Solberg

There is much more to engineering pioneer Halvor Solberg than a name on the building.

Students

12 Sport and science

Time and time again, student-athletes are proving that success in the athletic arena and the engineering classroom are compatible challenges.

14 Tau Beta Pi honors

Megan Waytashek and Ryan Mahutga were among 30 people nationally to receive a \$10,000 fellowship. Above and beyond that, Waytashek also was one of five people to receive a Laureate Award, only the second SDSU student to be so honored.

16 Student news

From racing teams to quiz bowl squads, students are finding extracurricular success.

College

18 Dean's Advisory Council

Meet new council members Paul Bezdicek, Carla Gatzke, Gary Larson and Gene Sieve.

19 Nadim Wehbe

For the third time, Wehbe has been honored as a fellow. This time by the American Society of Civil Engineers at its national convention in New York City.

20 In memoriam—Kevin Dalsted

Dalsted, who served the college for nearly 40 years, died July 14, 2015, in a farming accident in Colorado. Colleagues remember his inspiration and dedication.

22 Google Earth Award

Imaging engineer Larry Leigh becomes the first SDSU researcher to receive a Google Earth Engine Research award, a one-year, \$46,000 grant.

24 Retirements

David Galipeau, Susan Goens, Don Hosek, Ross Kindermann, Ann Monnens, Mike Monnens, Ken Skorseth and Donald Struck have all taken retirement.

26 Not an ordinary camp

A new electrical engineering camp for teens also had a focus on outdoor adventures.

Alumni

28 Mark Hegge

Meet the mechanical engineer who had a role in photographing Pluto this summer.

30 Carrie Hruska

The electrical engineering grad has found success at Mayo Clinic in Rochester, Minnesota.

34 Derek Hengeveld

The senior engineer at LoathPath in Albuquerque hasn't lost his passion for music.



We've moved **in**

Students benefit from shop space, active learning classrooms in new Architecture, Mathematics and Engineering Building

New classes, new spaces, new perspectives. That could be one way to describe the immediate impact the Architecture, Mathematics and Engineering Building has had on faculty and students. Dean Lew Brown has called the 62,000-square-foot facility the “final crown” on a 13-year period of construction projects for the Jerome J. Lohr College of Engineering.

The building houses shared laboratory space for mechanical engineering, and construction and operations management departments on the first floor, the mathematics and statistics department on the second floor and the architecture department on the third floor.

Faculty members agree the new building will stir them out of their comfort zones and benefit students.

“Students will be exposed to viewpoints from faculty members and students outside their main cohort, which didn’t happen before

when these departments were distributed across campus,” said Kurt Cogswell, head of the Department of Mathematics and Statistics.

The south side of the red brick building holds nearly an entire wall of windows. Upon entering, students can study in an open lounge area. Internal windows show a fishbowl-type view of students working in shared shop spaces.

“When people walk into the building, they immediately see students working in the labs,” said Teresa Hall, head of the Department of Construction and Operations Management. “It’s great for high school students to get that first glimpse and picture themselves working in those labs.”

Inside the production lab area, open spaces and work rooms allow students and faculty to work on projects with a secured storage area for tools and equipment. Three overhead doors open on the north side of the building where an open-air paved workyard allows students to build larger scale projects outdoors.



Back inside the main entrance, to the west, a hallway is open to Solberg Hall and a staircase leads to the second floor which houses the Department of Mathematics and Statistics. Walls of windows lighten the space, which faculty members said, is a huge upgrade from Harding Hall.

Bigger and brighter

“It’s so much different than when we were in Harding Hall,” said Donna Flint, mathematics professor and student recruiter. “Even though Harding was small, cramped and dark, I really did like some aspects of the building, but the light in this new building is great.”

Three lounge areas on the floor allow students to work on homework and meet with faculty and friends. “We want our students to be comfortable around faculty members,” said Cogswell. “Professors are

much more accessible to students in the new building.”

The math help center and three active learning classrooms are housed on the floor.

A lecture-style room has two SMART Boards and wheeled tables and chairs to ease transition into groups. Two active learning classrooms have fixed learning pod tables with laptop plug-ins and a monitor at each table on which the instructor can display lecture notes to the class or students can display work from their individual laptops.

Faculty offices have dry-erase walls and moveable tables with space to fit 3-4 students. “Each office was designed to be large enough for our professors to get a small group of students together to discuss mathematics and statistics,” Cogswell said. “It makes it much easier for our faculty to

meet with students directly in their offices outside of class.”

Up the stairs, on the third floor, is the architecture department. A large room with studio desks and an open work area is flooded with outdoor light through north, south and east windows.

Safe lab practices

Before, the architecture program was dispersed throughout five spaces—Harding Hall, The Barn, DePuy Military Hall, Solberg Hall and the heat and power lab.

“This building brings us all together, and our shop isn’t all the way out by the horse stables,” said Brian Rex, head of the architecture department. “Our faculty offices are where the students are now, and



“For our program, the primary benefits are the fabrication and prototyping space that will allow students to turn raw stock and materials into finished components and devices,” said Kurt Bassett, head of the Department of Mechanical Engineering.

“Things have been going well. Sharing of equipment will be a big benefit in terms of efficiency. We are looking forward to more interdisciplinary collaboration on design and research projects. There are multiple scenarios, like design and construction of buildings, where all of the disciplines sharing the new facility can have a role to play in the development and realization of a product.”

Active learning math classrooms

A professional, public face for the department is what Cogswell is excited about. “Harding Hall wasn’t the best first impression,” he said. “We’ve had many visits to our new AME Building and parents and prospective students are just amazed. It is visually impressive, and the building will enable us to provide better educations for their sons and daughters. We will love having our alums come and visit us in this new space.”

Cogswell said, not only does the building look new and nice, but it also is functional. “From day one, we worked with donors and architects to make sure the building could serve everyone,” Cogswell said. “For example, students are much better served by our new active learning rooms. The old lecture layouts don’t lend themselves to the group learning process, and once our math students get into the workforce, they will be moving into careers that frequently have them working in groups.”

The second floor also houses the new math help center that allows for students to get free, walk-in tutoring, and the math education library is filled with resources for math education majors to use. Math education students can go in there and get extra supplies, like math manipulatives and books.

“The functionality of the space is hard to beat,” Cogswell said. “The building is also wheelchair accessible, so a student with limited mobility can now get to my office, where in Harding, that wasn’t possible.”

Flint gives student tours and recruits math majors throughout the year. “All I was able to show high school students in Harding Hall was the little study hall. Now, I give them a tour of the second floor and show them the new

“All I was able to show high school students in Harding Hall was the little study hall. Now, I give them a tour of the second floor and show them the new classrooms and the terrific student space where students can study.”

—Donna Flint,
mathematics professor and
student recruiter

Donna Flint is all smiles when nearly finished unpacking boxes after moving into the Architecture, Mathematics and Engineering Building in summer 2015.

the wood shop and metal shop are together. Students won’t have to wonder where the professors are now; they know we will be here.”

Central scheduling will be key in the operation of the shop space on the first floor. “It’s going to make labs more safe for students,” Rex said. “We won’t have students coming in late at night to work on projects. Students will know when they can be here, and will be required to do their lab work during that time. There will be a lot of rule setting at first, and then we will relax them a bit once we get going and figure out how we all work together.”

Engine lab for ME students

The shops allow mechanical engineering students the space and resources to complete design projects for class and design competitions. The building will also provide a capstone design lab that serves as a base for student teams to work on senior projects. An engine lab provides students a space to operate a gas turbine and conduct performance tests on other engines.



Left, Jerry Lohr addresses attendees during the Architecture, Mathematics and Engineering Building dedication in April. Right, attendees pick up hors d'oeuvres on the third floor, home to the Department of Architecture.

classrooms and the terrific student space where students can study. I can talk about how nice it is to have students working here on the same floor as faculty offices so we connect so much more easily.”

Flint enjoyed teaching in the active learning classroom in Daktronics Engineering Hall and is excited to be able to use the new active learning classrooms in the AME Building. “In Dak, the students would ask, ‘Can we go to the boards today?’ I look forward to continuing that opportunity and keeping students engaged in my classes. In the lecture room, faculty members are able to reconfigure the tables for groups or standard lecture. The room really allows for a variety of different learning styles, which is important in instruction today.”

‘Change is good’

Dan Kemp is teaching Honors Calculus I and III and senior seminar sequence this fall. “I teach all of my classes in one of the new classrooms,” Kemp said. “A computer is connected to the main station, and what I’ll be doing differently this year is that I will have the students work on their problems at the group table and then have them present their equations to the classroom right from their table.”

Kemp said a lot of his classroom instruction will be changed because of the active learning classrooms, but after teaching at SDSU for 40 years, he is embracing the change. “I’ve been trying to lecture less in recent years,” he said. “I won’t be standing in front of a blackboard now. I am positioned in the center of the classroom, and I think students are more

comfortable reacting to the center of the room.”

Kemp said he is also looking forward to more interaction with colleagues. “With the way this floor is set up, I will be seeing my colleagues more even if it’s to get copies at the printer or using the kitchen. I think it will be nice. More faculty interaction will help everyone out, and I think, for the most part, we will all be happier.”

Shared shop space, a slide puzzle

Hall said she is excited to start with a clean slate. She said it will be both a challenge and an opportunity bringing four distinct and unique programs together in a shared space.

Hall and her faculty members’ offices will remain in adjoining Solberg Hall. “It’s nice to be connected to the new building, but still be housed in historic Solberg,” she said. The hallway area that connects Solberg and the AME used to be where horses were stabled in the early 1900s, when engineering was still taught in Solberg Hall. “The central space was like a parking lot for carriages coming to Solberg,” Hall said. “The north and shops had blacksmithing, carpentry and machining.”

The four disciplines have been working together to figure out the first floor shared lab space.

“It’s like a big slide puzzle with all the student projects being scheduled,” Hall said. “We know this first year will be a learning experience, and we are committed to finding the best way for each department to be successful. All of our

programs will benefit from this collaboration.”

New classes

Hall is excited the new space will allow for new classes, which there wasn’t room for previously. “We are planning on a bricklaying seminar,” Hall said. “In the spaces we had before, the basement of Solberg was like a rabbit’s warren with little rooms here and there. Now, we have this clean slate to do big-scale projects as well as studio labs on methods and materials.

She said faculty members are looking forward to instructing in the lab space. “We have the ability to gather students for equipment or process demonstrations and then let them go to work. This production lab space is dedicated to active learning.”

Hall is also integrating a functioning foundry in the building. She has already purchased the melt furnace and said foundry classes will likely be ready fall 2016. “We will be able to pour aluminum and brass castings. When we are functional, we will hold foundry workshops for faculty, staff and students.”

During the summer, Hall, a self-proclaimed “Deere foundry rat” brought in a metal casting expert from the University of Northern Iowa. “It’s exciting for us,” she said. “We weren’t able to do much casting in the space before. Over time, we hope to become a Foundry Education Foundation-affiliated school.”

Karissa Kuhle

3 generations

Rittershaus

Rittershaus link to college
into third generation

A half-century after Fred Rittershaus enrolled at State, a third generation is following the successful engineer's footsteps.

Grandson Jacob Gubbrud enrolled in the Jerome J. Lohr College of Engineering in fall 2014 and this fall his cousin, Dylan Rittershaus, is a freshman. In between are Rittershaus' sons, John and William. His daughter, Mary, who is Jacob's mom, earned her bachelor's degree from Augustana College.

The grandsons said they didn't get any pressure to extend the Rittershaus legacy because the university sold itself.

"The family was very neutral. They wanted me to go where I felt best," said Dylan Rittershaus, who graduated in May from Brookings High School and will be studying civil engineering, just like his father, John '89, and his grandfather, Fred '58/'62.

John added, "I said whatever he picks, that's his decision. He didn't have any persuasion from me or my dad."

Gubbrud, who graduated from Cedar Falls (Iowa) High School in 2014, said there was subtle recruiting. "Every holiday or birthday I'd get something SDSU. Every Christmas I get SDSU socks. Now I have enough to go two-straight weeks without doing laundry."

When he does need to do laundry, Jacob usually goes to the south Brookings home of Fred and Ardyne Rittershaus.

"We enjoyed his first year. He'd come over to have an occasional meal or we'd go out to eat," Fred Rittershaus said.

Jacob: Honors College 'awesome'

This fall, Gubbrud returned to Honors Hall. He said his first year in the Van D. and Barbara B. Fishback Honors College "has been very fun for me." Through Honors College, he was able to explore his interest in renewable energy and hopes to go deeper in the field through his studies in electrical

Posing on the step at Sylvan Theatre are, from left, Dylan Rittershaus, Fred Rittershaus, John Rittershaus and Jacob Gubbrud. Grandfather Fred started the State tradition in 1955.

engineering, perhaps finding a career there.

“Sometime in high school I got really passionate about renewable energy,” Gubbrud said.

Part of the 2014-15 Honors College program was a special topics class on renewable energy. A group project was to develop an energy portfolio for Germany for 2035. Individually, Gubbrud gave an overview presentation on renewable energy at an Upper Midwest honors conference in Mankato, Minnesota.

Outside of academics, Gubbrud got involved with Sigma Phi Epsilon, a fraternity focused on philanthropy, he said. Gubbrud also is active in the campus ministry Intersivity and serves on the electrical engineering/computer science student advisory council that meets once a semester with the department head.

Gubbrud’s roots are in South Dakota (his great-grandfather Archie was governor in 1961-65), but he hadn’t lived in South Dakota since sixth grade.

Even though he had been to SDSU for sporting events, attending as a student “felt a little weird because I knew zero people at first. But I felt very welcomed, especially by the faculty. SDSU has a lot going on in renewable energy and smart professors there. Plus, the facilities are super nice compared to other schools I visited,” Gubbrud said.

Dylan: SDSU over AFA

Dylan was a center on the Brookings Rangers hockey team in high school and is excited about playing club hockey in college.

John Rittershaus wasn’t sure if Dylan would enroll at State. “He had even looked at the Air Force Academy,” but he’s happy his son will be staying in town. “SDSU has been good to us.”

Fred: Started on G.I. Bill

Fred Rittershaus wanted to come here and become a civil engineer when he graduated from Freeman High School in

1952, “but I didn’t have the bucks to go to State.” So he spent a year at Freeman Junior College and joined the South Dakota Air National Guard, which briefly turned into active duty.

Rittershaus pursued pilot training. When that didn’t work out, he returned to South Dakota Air Guard and used the G.I. Bill to earn his civil engineering degree. He had good science and math teachers at Freeman and did quite well at State. Rittershaus supplemented that with practical experience.

In summer 1956, after his sophomore year, he ran a surveying crew for the Hutchinson County Highway Department on an 8-mile grading job.

Teaching classes, taking classes

In 1957, a member of the civil engineering faculty had been called into military service shortly before school was to start in September. The civil engineering department head asked university president John Headley if Rittershaus could teach the surveying class. Headley agreed.

So for a year, Rittershaus had the option of going to the faculty lounge or the student lounge. Before he earned a diploma, he also taught classes on the statics, strengths of materials, dynamics and fluid materials.

“It kept me away from the pool halls. There wasn’t much time for that. When you’re teaching a class, you can’t let the students get the upper hand on you,” Rittershaus said.

His teaching ability he credits to “a good, solid, problem-solving background.”

Banner career begins in 1958

Rittershaus continued to teach while in graduate school. During the summers and weekends, he was designing bridges for Interstate 29 for Cal Vaudrey with J.T. Banner & Associates, which opened a Brookings location in 1953 with associate professor Vaudrey as Joe Banner’s partner.

“In summer 1964 I had to make a decision—get a doctorate and go into academia or practice engineering,” Rittershaus said.

He decided to follow Vaudrey’s example. “You couldn’t find a better boss,” Rittershaus said of Vaudrey. The fledgling business was located in Vaudrey’s basement at that time. By the time Vaudrey retired in 1989, it had grown to 130 employees in five offices.

Rittershaus served as assistant office manager for several years and became chief executive officer the last couple of years before his December 1996 retirement.

John: From summer worker to senior engineer

Like his father, John Rittershaus’ first engineering experience came on a summer highway crew.

“I happened to get a summer job with the (state) highway department after my first year of college,” John Rittershaus said. “There was a lot of surveying, construction staking, material testing, plant work and inspections.” He continued with the highway department each summer while in college.

After graduation in 1989, a permanent position opened in Brookings and he has been with the department in Brookings ever since.

Now the senior engineer, Rittershaus sees civil engineering as a field with good job opportunities. That, more than family lineage, drew Dylan into civil engineering, John Rittershaus said.

Dylan Rittershaus said during New Student Orientation he was impressed by the faculty’s helpfulness and the study groups that are available.

He also said he will be following his father’s advice: “Stay in the dorms (Young), they’re a good time; and stay on top of your homework. If you get behind, it’s tough to catch up.”

Dave Graves



4 generations

Solberg

connection returns to State

Four generations after Halvor C. Solberg made his indelible mark on the college and South Dakota State, Peder Solberg and Andrew Mueller are freshmen here.

The cousins from the Twin Cities are the great-great-great nephews of Solberg, the man credited with starting mechanical engineering instruction at what was then South Dakota Agricultural College. He served on the faculty from 1891 until his death July 9, 1932, and was department head the last 30 years.

(Note: The school didn't become known as South Dakota State College of Agriculture and Mechanic Arts [commonly "State College"] until 1907.)

Peder Solberg and Andrew Mueller's lineage traces back to Halvor Solberg's brother, Lars, who was a farmer at Gary.

The freshmen have little knowledge of Lars or his more famous brother. Their point of connection is their grandfather, Conrad Solberg, who is Lars' grandson. Conrad Solberg's father, also Conrad, followed in Lars' footsteps and farmed at Gary. But he died when Conrad Jr. was 2.

He and his mom, Esther, stayed on the farm for several years, but moved to Brookings in 1946 when Conrad was in the fourth grade. He graduated from Brookings High School in 1954 and attended State, which was only a few blocks from his Seventh Street home.

Conrad studied mechanical engineering and his mother, a country schoolteacher, also took classes, both graduating in 1958.

After graduation, Conrad moved to White Bear Lake, Minnesota, a northeast suburb of Minneapolis, and continues to live there. He worked for General Mills, Control Data and Smarte Cart, of which he became president. Then he went into business with son-in-law Mike Mueller at Forest Products Supply.

“But when I saw the campus and met with the faculty who were here, it was much more impressive than I ever suspected.”

Peder Solberg

None of Conrad’s children—Sally (Mueller), Ryan or Paul—attended State; instead opting for the University of Wisconsin system.

Making SDSU his own

Peder Solberg, the son of Sarah and Ryan Solberg, also of White Bear Lake, wasn’t considering State either when he stopped in July 2014 near the end of a family trip. “It was more just checking the school out because of the family tradition. I wasn’t really thinking about attending South Dakota State at all.

“But when I saw the campus and met with the faculty who were here, it was much more impressive than I ever suspected.

“I thought it was kind of an average college. I didn’t really think too much of it. I knew it was a decent engineering college, but that was as much as I knew. It was more just the school that grandpa went to. I didn’t even think it was an option. After I visited, I saw it was one of my top options.”

In the fall, he applied for admission and completed scholarship applications. But he did the same with other schools.

Solberg, who graduated from White Bear Lake with a 4.47 GPA, was invited to the Briggs Scholar Weekend Feb. 27-28. In March, he got word that he was selected for a Briggs Scholarship, the school’s top award at \$6,500 per year, renewable for four years. That further set SDSU apart for Solberg.

“It was the best value by far for what you get,” he said.

His mom wished they had thought of State when oldest son Karl, 20, was selecting colleges. He stayed close to home and is getting a fine education in engineering at St. Thomas, but the price to be a Tommie is much greater than the

price to be a Jackrabbit, said Sarah Solberg.

Impressed by facilities, staff

Cousin Andrew Mueller (pronounced Miller) first stepped on campus in October 2014, when he visited with his father, Mike. Mueller, of Lake Elmo, had an interest in continuing his football career. Though he had not been recruited by SDSU, coach John Stiegelmeier entertained them for a half-hour in his office when the Muellers made an unscheduled visit with the head coach.

“We visited a lot of Division II and III schools. The nicest coach of all was coach Stiegelmeier,” Mike Mueller said.

While it is “cool” that SDSU is the school his grandfather attended, he said the attraction for him was friendly staff and new facilities. Of particular interest to the athletic training major and prospective linebacker are the Dykhouse Student-Athlete Center, the Sanford-Jackrabbit Athletic Complex and the new football stadium.

A happy grandpa

Of course, Conrad is happy to have the Solberg family again on campus. “It gives me a reason to go back for Hobo Day,” he said.

He was back as recently as April for the SDSU Foundation’s donor recognition dinner and has kept in touch with college classmate Jerry Lohr, the university’s leading private fundraiser, and with high school classmate Bob Fishback. “I always liked South Dakota and I always liked Brookings,” Solberg said.

When Conrad Solberg attended State, Solberg Hall was simply known as the Engineering Building. It didn’t gain its current name until 1966.

Solbergs connection to Solberg Hall

In fact, for most of Solberg’s time at State College, the Engineering Building was the engineering building. Crothers Engineering Hall, the college’s current headquarters, didn’t open until fall 1957. Today, the college boasts five buildings and four of those have been built or undergone major remodeling in the past 15 years.

Solberg Hall dates to 1901, but was closed in November 1998 when it was found to be structurally unsafe and incapable of supporting necessary loads.

The SDSU Foundation coordinated a \$3.93 million private fundraising effort to gut and totally rebuild Solberg’s interior as well as tuck-point the brick and stone façade and replace mortar joints as necessary. The work, directed by Sioux Falls Construction, brought Gov. Mike Rounds and Sen. Tim Johnson to the Oct. 10, 2003, dedication.

While the classrooms contained the most current in computer technology, the first-floor conference room was rooted in the past.

Conrad Solberg and Mike Mueller took the old-growth fir flooring from the condemned Solberg Hall and turned it into a pair of conference tables—4-foot by 6-foot and 4-foot by 10-foot—at their Forests Products Supply custom woodworking operation in White Bear Lake. Solberg spoke on behalf of the family at the dedication.

CONTINUED NEXT PAGE

Solberg family members assemble on the front steps of Solberg Hall on move-in day Aug. 22, 2015. Pictured, front row, from left, are Mary Mueller, Tryg Solberg, Sarah Solberg and Ryan Solberg. Back row, Mike Mueller, Mary Mueller, Andrew Mueller, Conrad Solberg, Peder Solberg and Mary Solberg. Andrew and Peder are freshman at SDSU, where their great-great-uncle is credited with starting the mechanical engineering program.



New Solbergs downplay connection

Now, 57 years after Conrad took his last class in Solberg and 12 years after the family donated tables for the rejuvenated Solberg, another generation of Solbergs were back in the building and seated around the table as they took a break from new student orientation to talk about discovering SDSU.

While Peder Solberg and Andrew Mueller are proud of the family tradition, they make it clear that they're not here to walk on coattails or connect with their heritage. When asked earlier in the day if he was related to the Solberg for which the building is named, Peder hesitantly conceded.

"I don't want other people to think that's why I'm here. That was very low on what impacted my decision to come here," he said.

Like others coming from the Class of 2015, the attraction was the brand-new Architecture, Mathematic and

Engineering Building, the nearly new Daktronics Engineering Building and an engaging faculty. The Solberg lineage may have sparked a lifelong interest in building things, but SDSU built its own attraction to the younger Solberg, he said.

Grandpa, who went to State a quarter-century after Halvor Solberg died and left eight years before the building bore his name, said, "There wasn't much notoriety of this Solberg name," during his college days.

Peder Solberg wants it to be that way again, creating his own mark on campus while continuing a proud Solberg tradition in engineering.

Dave Graves

Conrad Solberg, left, and his son-in-law Mike Mueller pose with one of two conference tables they made from flooring from what was then condemned Solberg. The hall, named after Solberg's great uncle Halvor, was rebuilt and rededicated in 2003. With two great-great-great nephews of Halvor Solberg now at SDSU, the family has renewed a connection to State.

Halvor C. Solberg

To many, Solberg simply is the name on an engineering building. But it is no exaggeration to proclaim his legacy to be one of the greatest ever at State.

“Halvor was perhaps the greatest long-term pillar in the institution’s early history. If you look at the students he turned out—Stephen Briggs and Charles Coughlin to name a couple—his leading role in constructing the first engineering buildings on campus, and starting the teaching of mechanical engineering, it’s easy to see that his impact lasted long beyond his 45 years on campus,” according to SDSU historian Chuck Cecil.

Here is the 30-second biography of Solberg, but the details that follow are truly staggering.

- Started the instruction of mechanical engineering at SDSU;
- Served on the faculty from 1891 until his death July 9, 1932;
- Led the department from 1902 to 1932; and
- Built the first engineering building on campus in 1887 with the help of students and \$5,000 from the Legislature. He then designed and supervised construction of the original Solberg Hall in 1901 as well as its 1930 expansion.

Came to America in 1878

Solberg was born March 5, 1861, in Brottem, Norway. He came to America at age 17, a few years after his parents had immigrated. The family lived on a farm in Spring Grove in southeast Minnesota. At age 20, Solberg moved to North Dakota and worked five years as a carpenter. He moved to Britton, South Dakota, in 1886 and spent the winter doing carpentry work.

Solberg came to Brookings in 1887 with the intent of gaining more education so he could be a contractor. He attended what was then called Dakota Agricultural College. He worked on the college farm and did carpentry work, including the building of desks for professors. At the time, Lewis McLouth, the second president in the history of the school, was the only one with a desk.

As a sophomore, in fall 1888, he was given an appointment to teach woodworking.

When college closed for the long winter break in fall 1888, McLouth recommended that three students be sent to Purdue University to learn how to teach. Solberg was one of those selected. He returned late February 1889 and was put in charge of all woodwork instruction.

He earned his bachelor’s degree in 1891 and started teaching engineering.

In early 1892, he was loaned by State College to go to Fargo, North Dakota, to start the course in industrial engineering at the new college of agriculture and mechanic arts there. He returned at the end of the year and was put in charge of all engineering work at State.

Builder of two engineering buildings

At his own expense, Solberg went to Pierre and lobbied the 1897 Legislature for funds for an engineering building. A bill proposed a \$15,000 appropriation, but it was cut to \$5,000 at passage. With that amount, some old lumber and the help of students, Solberg built a two-story, 40- by 90-foot structure where the military hall now stands.

A few years later he would draw plans, make specifications and supervise construction of what was then the Engineering Building and is now Solberg Hall. A \$40,000 appropriation had been received from the Legislature and work was completed in fall 1901, just four years after only receiving \$5,000.

(Note: The first building was used by the chemistry building until it burned in 1927.)

Brookings’ first car owner

Solberg also was probably the first person to ever drive a car to campus.

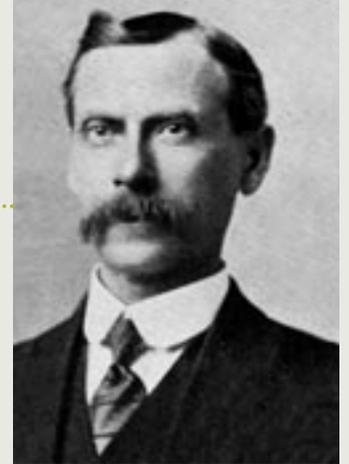
In 1904, he became the first person to drive a car in Brookings. The one-cylinder, Model A Cadillac had no top, no windshield, no radiator and no speedometer. It could travel about 15 miles per hour and a tire would last about 3,000 miles. Replacement tires (size 3 inches by 28 inches) had to be ordered from Indianapolis at a cost of \$27.

Of course, at this time there also was no need for garages or filling stations. Gasoline was shipped by barrels on rail and taken to the Solberg garage.

And at this time there wasn’t much of a road system.

In 1910, he began a two-year campaign at personal expense for the development of better highways in the state. He got the federal government to build a mile of “model road”—ditches for drainage, wide enough for passing traffic and a surface higher in the center than the edges to promote drainage.

Solberg worked with a small group that promoted the creation of the “Black and White” road from Chicago to the Black Hills. He is credited with laying out what is now U.S. Highway 14 from Winona, Minn., to the Black Hills.



Telephone poles were painted with black-and-white rings and a brochure was printed with directions on how to follow the poles to the next town.

Hayseed in the highway

Harry Solberg, the oldest of Solberg’s four children and head of the mechanical engineering department at Purdue University, told this story about pioneer automobiling.

His father drove the car to De Smet, about 40 miles from Brookings, one August day. “The highway was simply a pair of wagon tracks across the prairie. There were no ditches, no graded roads or anything of that sort. I think it was just plain flat country.

“When he got ready to come home, he couldn’t get the car started. He had to load it onto a railroad flat car and ship it back home by railroad where he got a team of horses to haul it up to the garage, where he could begin working on it. You see, there were no filling stations, no garages or anything of that sort in those days. A man had to take care of his own car.

“We found out that the carburetor, which was under the engine, which was under the front seat, had picked up a lot of hayseed from the grass that was growing in the middle of the highway in August. When we got all the hayseed from out of the carburetor, it ran again.”

Purdue’s loss, State’s gain

The inquisitive Solberg also is credited with building one of the first wind tunnels in the United States. This was while he was pursuing his master’s degree at Purdue. After earning the degree in 1895, he was offered a teaching position.

In good fortune for South Dakota, Solberg said “no” and returned to South Dakota Agricultural College and changed it forever.

Dave Graves

Editor’s note: Information for this story was taken from Solberg’s obituary written by the Brookings County Press, the Brookings Weekly Register, a 1931 feature on Solberg by the Register and the transcript of a 1989 interview with Harry Solberg, who was then 91.

Student-Athletes



excel in STEM fields

Student-athletes in the Jerome J. Lohr College of Engineering balance a heavy class load and full travel schedules. With help from their coaches and professors, golfers Grant Smith and Sydney McDonald and tennis player Iasmin Rosa have achieved successes both in the classroom and in their athletic pursuits.

This fall, 69 student-athletes are enrolled in the college.

Grant Smith



“I chose SDSU because they had my major and were very competitive with golf.”

At 6-feet-7, Smith is occasionally mistaken for a basketball player, but golf is his game. It has been since he was around 3 years old, he estimates.

“My dad got me into golfing early,” he said. Golf was a way for Smith, a junior from Johnston, Iowa, to bond with his father and brother.

“I chose SDSU because they had my major and were very competitive with golf,” Smith said. Since starting at State, he was named second-team all-conference last year, placed seventh at the Summit League Championship, played in a U.S. Open qualifier and holds the school’s single-round record of 65 strokes. In addition, he has been named a three-time Summit League Academic Distinguished Scholar.

He and his father have another passion in common in addition to golf—

mathematics. His father is a math educator, and Smith is majoring in math with a financial engineering concentration. He plans to work in predictive math in the business world following his graduation.

Smith has maintained at least a 3.0 GPA every semester of his college career thus far. He appreciates his instructors’ help keeping up with coursework when he has to miss class.

“We practice 20 hours a week, and we’ll miss at least 22 days of class this year. All of my math professors have been great about helping me make things up when I need to.”

Iasmin Rosa



“I’m a junior, and this is the year I really started to feel like a civil engineer.”

Rosa has family connections in her academics and athletics as well. Her father and brothers, who are engineers, got her started playing tennis at a young age. Originally from Brazil, Rosa received a scholarship to play tennis at State after playing for more than a decade and was pleased to find the university also offered a civil engineering degree.

“I’m a junior, and this is the year I really started to feel like a civil engineer,” said Rosa. “All my classes are more related to my major now.”

Rosa admits time management is a challenge as a student-athlete.

“It’s not easy. A lot of our matches are away, so when we do play, we miss at least

one day of class. I don’t get a lot of sleep, but I try to always pay attention in class, and we do homework on the road,” she said.

Rosa is looking forward to the season and is excited to have new teammates this year. The team was the conference runner-up last year, and Rosa believes it will continue to improve. Last year, she became the first Jackrabbit to be named to the All-Summit League team twice. She has also been named to the Summit League Academic Honor Roll, Distinguished Scholars List and Commissioner’s List of Academic Excellence.

After graduation, Rosa plans to attend graduate school for civil engineering, hopefully at SDSU, and will continue to play tennis for fun.

Sydney McDonald



“The coaches are so supportive, and our professors are great about helping me stay on track when I have to be gone.”

A senior from Calgary, Alberta, Canada, golfer McDonald wasn’t sure about attending SDSU until she visited campus.

STUDENT-ATHLETES IN JEROME J. LOHR COLLEGE OF ENGINEERING

“I fell in love with the school and with the team,” she said. “I knew that I wanted to be an engineer, so I met with Dr. [Suzette] Burckhard. She showed me around and was just so nice to talk to.”

McDonald, a civil/environmental engineering major, had always enjoyed math, but wanted to apply her math skills to real-world projects through engineering. Her proudest academic accomplishment at State was her ‘A’ in fluid mechanics class.

“That class was really hard,” she said. “I worked on it and spent a lot of time on it. Time management is definitely the key to balancing golf and my classes. After finishing that class, I think I might actually want to work in fluid mechanics someday.”

McDonald, an Academic All-Summit League selection, has had plenty of proud moments on the Jackrabbits golf team, as well.

“Last year, the team played in Florida, and we were really close to the lead going in the last day. I ended up shooting a 68, which was my first time shooting in the 60s in college. We won by one stroke. It was really cool to bring our trophies home,” said McDonald, who holds the school record for lowest score on 18 holes with that 68.

McDonald appreciates the help she receives from her coaches and professors.

“The coaches are so supportive, and our professors are great about helping me stay on track when I have to be gone,” she said. “They pack so much into lectures that it could be easy to fall behind, but they’re always willing to answer any questions I have. It’s great.”

In the future, McDonald plans to continue golfing but would like to focus on engineering. She expects graduate school is in her future. “I just really love engineering,” she said.

Madelin Mack

Name	Program1	Team(s)
Alves Pereira, Henrique	Construction management	Men's Tennis
Anderson, Adam	Electronics engineering technology	Football
Andronowitz, Jessica	Civil engineering	Equestrian
Batenhorst, Noah	Mechanical engineering	Men's Swimming and Diving
Branick, Brendan	Mechanical engineering	Men's Track and Field
Brockel, Brady	Civil Engineering	Men's Track and Field
Bye, Brett	Agricultural and biosystems engineering	Wrestling
Carlson, Elle	Mechanical engineering	Women's Golf
Carr, Nicholas	Mechanical engineering	Football
Christensen, Weston	Civil engineering	Men's Swimming and Diving
Clark, Matthew	Mechanical engineering	Football
Clemen, Andrew	Mechanical engineering	Baseball
Cook, Catherine	Mechanical engineering	Women's Swimming and Diving
De Souza, Beatriz	Mechanical engineering	Women's Tennis
Dibb, Tory	Mechanical engineering	Football
Duerr, Taylor	Civil engineering	Equestrian
Evans, Eldon	Mechanical engineering	Baseball
Finnes, Tyler	Mechanical engineering	Football
Fitzgerald, Matthew	Mechanical engineering	Football
Flaata, Tiffaney	Mechanical engineering	Women's Basketball
Flores, Antonil	Computer science	Men's Track and Field
Ford, Jacob	Agricultural and biosystems engineering	Football
Goedert, Dallas	Operations management	Football
Greeneway, Evan	Civil engineering	Football
Gross, Seth	Computer science	Wrestling
Hale, Brady	Computer science	Football
Hart, Kallan	Civil engineering	Football
Harvey, Nicole	Mechanical engineering	Equestrian
Hejna, Jordan	Mathematics	Men's Track and Field
Hendricks, Jessie	Mathematics	Women's Swimming and Diving
Janssen, Eric	Computer science	Men's Cross Country
Kassim, Ayub	Mechanical engineering	Men's Track and Field, Men's Cross Country
Lang, Caleb	Agricultural and biosystems engineering	Football
Langer, Cole	Mechanical engineering	Football
Lansman, Seth	Mechanical engineering	Football
Leiseth, Mason	Mechanical engineering	Football
Lewis, Marquise	Computer science	Football
Lima Moreira, Mateus	Civil engineering	Men's Tennis
MacDonald, Sydney	Civil engineering	Women's Golf
McAffer, William	Computer science	Baseball
Molitor, Elizabeth	Mechanical engineering	Women's Track and Field
Monjardim Rosa, Iasmin	Civil engineering	Women's Tennis
Munsterman, Jesse	Civil engineering	Baseball
Nichols, Brett	Operations management	Men's Track and Field
Odegard, Jacob	Mechanical engineering	Men's Track and Field
Ohnesorge, Jacob	Mechanical engineering	Football
Palmer, Sydney	General engineering	Women's Basketball
Pereira Castro, Marco Paulo	Civil engineering	Men's Tennis
Pereira, Lucas	Mechanical engineering	Men's Tennis
Plote, J.R.	Operations management	Football
Prasher, Samantha	Mechanical engineering	Women's Swimming and Diving
Priebe, Traxton	Mechanical engineering	Men's Track and Field
Radtke, Daniel	Mechanical engineering	Men's Track and Field
Ringhofer, Luke	Mechanical engineering	Baseball
Rumrill, Christopher	Electrical engineering	Men's Swimming and Diving
Sage, Brendan	Mathematics	Men's Cross Country, Men's Track and Field
Seymour, Blair	Civil engineering	Men's Track and Field
Sharrow, Cody	Construction management	Baseball
Simms, Brance	Construction management	Wrestling
Smith, Grant	Mathematics	Men's Golf
Sontag, Mark	Construction management	Baseball
Stephens, Jenna	Mathematics	Women's Track and Field
Tang, Chuck	Electrical engineering	Men's Tennis
Terwee, Paul	Mechanical engineering	Men's Track and Field
VanderHeiden, Jacob	Mechanical engineering	Football
Vejvoda, Mitchell	Mechanical engineering	Football
Weisbeck, Lexi	Construction management	Women's Cross Country, Women's Track and Field
Zazula, Nichole	Mechanical engineering	Equestrian
Zenner, Samuel	Electrical engineering	Football



Waytashek and Mahutga join elite group of engineering scholars

Standout SDSU student-athlete Megan Waytashek became only the second recipient of the Tau Beta Pi Laureate Award from the Jerome J. Lohr College of Engineering and she and classmate Ryan Mahutga were added earlier to another short list of State grads.

In August, it was announced that Waytashek was one of five people to receive the 2015 Laureate Award, which honors those who have excelled beyond their academic major in arts, athletics, service or diverse achievements.

Waytashek, a May graduate in mechanical engineering with a 3.97 GPA, was one of two people honored for athletic achievement.

Tau Beta Pi, the world's largest engineering honor society, has awarded only 98 Laureate Awards since beginning the honor 33 years ago. The only other SDSU grad to receive the Laureate Award was Lori Bocklund, a 1983 electrical engineering graduate who was a five-time All-American runner and helped her team to two national cross country titles.

The Laureates were honored with other 2015 national award winners at Tau Beta Pi's national convention Oct. 29 in Providence, Rhode Island. Each received a \$2,500 cash award and a commemorative plaque.

In the spring, it was announced that Waytashek and Mahutga were among 30 recipients nationally to receive a Tau Beta Pi Fellowship, which carries a \$10,000 award and is based on scholarship, campus leadership and promise of future engineering success.

That in itself is quite an honor. Before Waytashek and Mahutga received the Fellowship Award, only six other SDSU students had received the award in the past 82 years.

This is only the second year in which two SDSU students were chosen for the fellowship, according to Kurt Bassett, head of the mechanical engineering department.

The other occurrence was when mechanical engineering graduates Aaron Boomsma, of Wolsey, and Travis Kubal, of Scotland, were chosen for Tau Beta Pi Fellowships for 2008-09. Both used the

fellowship to work toward a doctorate—Boomsma at the University of Minnesota and Kubal at Purdue University.

Selections for the 2015-16 fellowships come from prominent universities like Ohio State, Duke and Case Western Reserve. But only two other schools—the University of California, Los Angeles and the U.S. Naval Academy—had as many selections as SDSU.

“These are very prestigious fellowships,” Bassett said. “If you look at the lists of winners over the years, you are most likely to see students from MIT, Stanford, Purdue, Cal-Tech, etc.”

The last SDSU student selected for the fellowship was 2011 mechanical engineering graduate Trevor Layh, of Winner, in 2013.

Mahutga, of Baltic, and Waytashek, of Lino Lakes, Minnesota, are attending the University of Minnesota this fall. Mahutga is working toward a doctorate in the department of biomedical engineering. Waytashek is pursuing a master's degree in mechanical engineering with an emphasis in biomedical engineering.

Mahutga: Completed 3 minors

In addition to his current award, Mahutga, a 2010 graduate of Baltic High School, received a \$2,000 scholarship from Tau Beta Pi for his senior year at SDSU.

A member of Tau Beta Pi since 2012, he served as a delegate to the national convention in Spokane, Washington, Oct. 2-4, 2014. Last year, he was the chapter vice president. Mahutga also held an undergraduate research post and was active in several clubs.

He maintained a 4.0 GPA throughout college and minored in sustainable energy systems, mathematics and business.

Bassett said, “Ryan was an outstanding student, graduating summa cum laude and completed challenging research projects. He had experience in a variety of applications, including industry



“I’ve always been interested in how mechanical engineering incorporates with medicine and medical design.”

applications as well as computational fluid dynamics modeling.

“Completing three minors is very unusual for engineering students.”

An influential video

Heading into his senior year, Mahutga was considering sustainability research in graduate school. But he also had an interest in biomedical engineering and after watching a video that was sent to him last fall by a friend, “the light bulb went on.”

The video was of a hydraulics engineer who used a CT scan to create a custom aortic sleeve. “I thought, ‘If he could do it, why couldn’t I?’”

Mahutga isn’t quite sure what he will be doing at the University of Minnesota. The first semester is spent doing rotations with various professors. Then students request to be teamed with one of the research professors. At SDSU, a lot of his research dealt with computational fluid dynamics and flow modeling.

Research career began with cornstalks

He worked as a research assistant with assistant professor Stephen Gent and program engineer Mike Twedt his sophomore and junior years.

Mahutga got started when he was selected for the National Science Foundation’s Research Experience for Undergraduates. That provided a stipend and allowed him to complete an independent research project on mathematical modeling with torrefaction, a heating process to produce solid biofuels.

His reaction kinetics computer model determined if X amount of cornstalks and leaves were burned, Y amount of solid product and gases would be produced.

In his junior year, he ran a lab-scale reactor that would burn the crop residue at 200 to 300 degrees. The solid finished product was then tested for density and water uptake. The theory is that the coal-like biochar could be burned by farmers in the grain-drying process, saving the expense of propane.

Further study of the process awaits additional grant funding, Mahutga said.

The biochar also could be used for fertilizer, he said.

Conferences, classes key to college

Mahutga’s senior design project was a robot made with two fellow students for a student design contest conducted by the American Society of Mechanical Engineers. The 25-by-25-by-30-inch robot had to be able to roll up a ramp, go through water and sand, and up two stairs. The team won an award for best use of predicted design.

The contest was in early April and coincided with the ASME student development conference that Mahutga attended.

Those events in Milwaukee as well as the national Tau Beta Pi conference that Mahutga attended in Spokane with two other members of the SDSU chapter are some of the strongest memories that he is carrying away from SDSU. “The people, the other students in your classes, are really what makes college,” he said.

Mahutga hopes to continue to be able to connect with students. His career goal is to teach and do research at a university.

Waytashek: Medical interest

Waytashek, a 2010 graduate of Centennial High School, has her eyes on a career designing medical devices.

She had a three-week job-shadowing internship at Mayo Clinic in summer 2013 and added a paid summer internship in St. Paul, Minnesota, with Boston Scientific, where her father develops components for defibrillators, following graduation.

“I’ve always been interested in how mechanical engineering incorporates with medicine and medical design,” Waytashek said.

Last summer, she did research on auxetic structures with faculty member Todd Letcher and used a 3-D printer to produce prototypes.

Success on the hardwood

Of course, most of her free time was spent on the basketball court.

The four-year letterwinner was chosen as a second team Capital One Academic All-America® this spring and was a three-

Megan Waytashek

time Academic All-Summit League selection.

In her senior year, the forward led the Jackrabbits in scoring (14.1 ppg) and steals (4.3). She became SDSU’s 33rd 1,000-point scorer, finishing with 1,390 points. En route to her third first team All-Summit League selection, Waytashek scored in double digits 24 of 31 games.

She topped her athletic career by being one of 87 athletes nationwide to be chosen for the \$7,500 NCAA Postgraduate Scholarship.

Bassett said, “Megan was not only a tremendous athlete but also a superior student, graduating summa cum laude. She threw every ounce of effort into everything she did. She was very interested in the biomedical applications of mechanical engineering, so she completed both research and design projects that had unique biomedical applications.”

Blessed with helpful faculty

Bassett, who was her adviser, took an interest in Waytashek’s hoops career and kept a clipping of her performance taped to his office door.

She said Bassett’s interest in basketball is typical of others on the faculty. Waytashek said faculty members also would meet with her outside of office hours and send tests with the coach for him to administer while they were on the road.

As she thinks back to her college days, Waytashek said she was thankful for “being surrounded by such a great staff. They were so accommodating with my basketball schedule. It was a really great group of faculty and students and they made my time here so rewarding.”

She also holds strong memories of the teammates she played with during five seasons at State. “I made memories and friendships that will last a lifetime.”

Of all the awards she has garnered at State, Waytashek said she is most proud of her Academic All-America® second-team selection. “It was rewarding to see my academics and athletics come together and be recognized for all the hard work I put in on and off the court.”

Dave Graves

Construction Quiz Bowl team reaches semifinals



The construction management program had one of its teams reach the semifinals of the fourth annual Construct*ium Quiz Bowl at the University of Minnesota Oct. 2.

The team of Elliot Reiner, Tyler Kappenman, Logan Prouty and Calder Eschenbaum was tied with the University of Minnesota entry at the end of the competition, which, using a Jeopardy-style format, tests students on structures, law, accounting, project management, estimating and scheduling. But rather than a tie-breaking question, a coin was flipped and it landed in the Gophers' favor.

"This was the second year in a row SDSU was eliminated by a University of Minnesota coin," said adviser Ken Bertolini.

The Gophers went on to win the 10-team tournament, which attracted entries from seven construction management programs in the Upper Midwest.

In addition to the contest, students were able to meet with industry leaders, participate in a career fair and tour the under-construction Vikings Stadium.

Two teams of SDSU construction management team members gathered at the University of Minnesota for a regional quiz bowl. Pictured, from left, are Hunter Morsching, Elliot Reiner, Nathan Wentz, Tyler Kappenman, Calder Eschenbaum, faculty member Ken Bertolini, James Bechina, Nicholas Swisher, Bob Wessel and Logan Prouty.

SDSU Wild Hare Formula



The SDSU Wild Hare Formula SAE team achieved a long-standing goal of a top 10 finish in the highly competitive comprehensive contest sponsored by the Society of Automotive Engineers when the SDSU students finished seventh at the June 17-20 contest in Lincoln, Nebraska. There were 65 other university groups from across the United States, North America and the Far East. The competition involves oral presentations on design and a business plan as well as dynamic events in acceleration, braking, autocross, endurance and gas mileage, all completed using the competition car that was designed, fabricated and built by the students the preceding two semesters. The group is funded by industrial sponsors, the SDSU mechanical engineering department, the Jerome J. Lohr College of Engineering and the SDSU Students' Association. The team includes students from various majors and is housed in the mechanical engineering department. Faculty members William Bloxson and Stephen Gent accompanied the team.

Back row, from left: Brandon Westrick, Adam Longtin, Lance Mattison, Max Sauer, Joe Brandner, Alex Kenkel and Ryan Hoium.

Front row: Shaun Brown, Evan Glanzer and Ayrton Kuzela.

Team members unable to attend the competition were: Jay Davison, Alec Whitcomb, Cory Jacques and Trevor Linden-Hansen.

Howe tabbed for Tau Beta Pi award



Erik Howe, a senior mechanical engineering major from Anoka, Minnesota, has received a \$2,000 Tau Beta Pi scholarship for 2015-16.

Howe, a member of the Van D. and Barbara B. Fishback Honors College with a minor in sustainable energy, will graduate in May 2016 and then pursue the option of a master's degree in renewable energy. Howe, president of the SDSU chapter of Tau Beta Pi, foresees a career providing sustainable energy systems to developing countries.

"I desire to use the education that I have had to serve those who could be blessed the most in our society.

"If energy systems were reliably incorporated into poor communities, clean and healthy environments could be an option rather than air-polluted homes and contaminated water and cooking utensils... When trained, the community would take ownership of these energy systems and maintain that the systems properly operate," Howe said.

In addition to Howe's work with Tau Beta Pi, the all-engineering honor society, he is involved in the SDSU chapter of the American Society of Mechanical Engineers, intramural sports and helps lead Bible studies with the Navigators.

Tau Beta Pi Scholarships are awarded to senior members on a competitive basis of high scholarship, campus leadership and service and promise of future contributions to the engineering profession.

State entry debuts in Human-Powered Vehicle contest



Pedal power shifted gears from a way to get around to a challenging engineering project when a group of mechanical engineering students developed an entry for an international contest.

In April 2015, SDSU had its first entry in the Human-Powered Vehicle Challenge sponsored by the American Society of Mechanical Engineers. The contest, which has been around since 1983, is the environmentally minded brother of the Formula SAE racing car contest.

The college has had a Formula SAE car entry for years, but ASME chapter adviser Greg Michna wanted to develop a Human-Powered Vehicle team to increase the opportunities for hands-on learning for his students.

He found a receptive group of 13 students, including many freshmen and sophomores, who were ready for an extracurricular adventure. Much of the recruiting was done by Mitchell Hoelsing, who was approached by Michna with the idea in spring 2014

Hoelsing, an avid cyclist and a May 2014 mechanical engineering graduate, sat down with department head Kurt Bassett to get guidance on how to recruit team members and sponsors.

In fall 2014, the mechanical engineering graduate student was talking to freshman classes about the opportunity and getting other instructors to recruit members.

Places in upper half of field

They developed a two-wheeled recumbent bicycle with a torpedo-shaped shell and an open cockpit, and took it to the West Region competition in San Jose, California.

Out of 36 entries, SDSU placed 14th overall and 9th in design. Vehicles also were ranked on speed, endurance and innovation.

Associate professor Michna called the placings “very respectable,” noting SDSU topped in-state rival South Dakota School of Mines (17th overall) as well as several prominent universities (University of California-Berkeley, two teams, 16th and 18th overall; University of Arizona, 22nd; and UC Davis, 24th).

Hoelsing said, “I was very proud of how the team did for being the first year and not really having an idea of how to do things. To get a working bike our first year and do as well as we did, there was a lot of satisfaction. Also, personally, I gained a lot of satisfaction from managing everybody on the team. It was a big challenge, but a good time. I learned a lot.”

A couple unique features

SDSU's entry was unique in that it had front-wheel drive. The chain went directly from the crank to the front wheel, reducing drive chain complexity, he said.

However, the feature entered in the innovation category was an adjustable frame, which meant any team member could—and did—pedal the entry at the San Jose contest. The distance between the seat and the cranks could be altered by changing the amount of overlap between the front and rear subframes.

Nine of the 13 team members and Michna were able to make the 3,600-mile round trip by van—no pedals—a week before semester finals.

Changes planned for 2016

The 2016 team has grown to 20 members, including all but two members from 2015. Hoelsing is back, but in more of a consultant role with junior mechanical engineering major Brennen Walley as the captain.

One of the lessons learned from the 2015 contest is more stability is needed in the human-powered vehicle. Hence the 2016 design will be a “tadpole trike” with the drive wheel in the back and two steering wheels in the front, Hoelsing said.

With a 6-foot wheelbase, it will be a little smaller than similar three-wheeled motorcycles seen on the street and the rider will be inclined to improve aerodynamics, he said.

Stability is particularly critical in the 2 ½-hour endurance challenge, which includes speed bumps, rumble strips, U-turns and slaloms, Michna said.

The weight of the 2015 entry—85 pounds—also hurt stability, Walley said. With 2-inch steel tubing used throughout the frame, “you could compare ours to a tank,” Walley said. The plan for 2016 is to cut the weight in half. The new frame material hasn't been selected yet, he said prior to the group's late October meeting.

This fall is dedicated to design and analysis with construction to begin in January in the Mechanical Engineering Fabrication and Prototyping Lab in the new Architecture, Mathematics and Engineering Building (see story Page 2).

With team members pedaling away from the 2015 contest with positive feelings and a better understanding of what to expect, makers of the 2016 Rally Rabbit are looking forward to a return trip to San Jose, Walley said.

Dave Graves



Members of the 2015 Human-Powered Vehicle team pose at the site of the West Region contest in San Jose. Pictured, back row, from left, are Evan AlMBERG, Brennen Walley, Mitch Hoelsing, Mitch Klein and Isaac Steele. Front row, Geneva Petrich, Sidney Smith, Darrin Zomer, adviser Greg Michna and Jake Ostby in the bike.

Dean's Advisory Council – new members

Three industry leaders have recently joined the Dean's Advisory Council for the Jerome J. Lohr College of Engineering, which held its semiannual meeting Oct. 22. A short profile of each newcomer follows.

Paul Bezdicek

In the spring, the 2006 mechanical engineering graduate accepted an invitation to join the council because he is interested in bringing the perspective of a younger engineer to the council while interacting with other members of the council, which currently stands at 26 members. Bezdicek also believes he can facilitate interaction between industry and SDSU.

His role in industry is as a senior sales engineer with Ingersoll Rand Industrial Technologies in Sioux Falls.

He has spent his entire career with Ingersoll Rand, beginning in technical sales working in four different locations during his eight months of training. His first permanent position was in Omaha, Nebraska, serving more than 1,000 accounts in Nebraska, Iowa, South Dakota and North Dakota.

From August 2012 to November 2013, Bezdicek worked as an account representative for Trane, which is an Ingersoll Rand holding.

Since November 2013, he has been in his current position. His focus primarily is in selling large centrifugal and oil-free air compressors to major food producers, ethanol and grain processors and power generation accounts in the four-state region. He has overseen a growth in pipeline projects from \$2.5 to \$9 million.

He hopes the Dean's Advisory Council will continue to provide curriculum recommendations that help keep students up to speed with changing workplace conditions and generate ideas for scholarships and funding support in addition to providing valuable feedback for SDSU faculty.

In his spare time, Bezdicek enjoys hunting, fishing and spending time with Jessica, whom he married in June 2014. She is a nurse coordinator at Avera. They live in southwest Sioux Falls.



Carla Gatzke

The vice president for human resources at Daktronics joined the council this summer to offer insight from Daktronics' experience in employing engineering graduates from SDSU and other universities.

"We believe the SDSU engineering programs are outstanding and we want to help sustain and further develop them," said Gatzke, a 1984 electrical engineering graduate. Daktronics, based in Brookings, is a world leader in the large electronic display industry with more than 2,500 employees worldwide, including 250 college students.

"Our hope for the college is continued success in recruiting, educating and graduating high-caliber professionals, who have knowledge and capability that is relevant to area employers and who have an interest in building their careers at the great companies in our area," Gatzke said.

She adds that the human resources group at Daktronics "facilitates multiple activities to foster communications between professors and students in activities related to work at Daktronics.

"For example, I'm currently helping with the Industry Advisory Board that's supporting the work of the Jerome J. Lohr College of Engineering in pursuit of a master's in engineering, and with an advisory board that is supporting the development of the Division of Management and Economics."

Gatzke, who has been with Daktronics for more than 30 years, also serves on the boards of the Brookings Economic Development Center, Brookings Boys and Girls Club and East Central Behavioral Health.

She is married to Brian Gatzke, a 1985 SDSU graduate with degrees in commercial economics and agriculture business. He owns Northern Plains Appraisal in Brookings.

The Gatzkes have two children.



Gary Larson

With the idea of making sure as many individuals know what one can do with a STEM (science, technology, engineering and mathematics) education, Gary Larson will join the council. Larson, a 1988 graduate in electrical engineering technology, is the president of Electronic Systems Inc. The firm, which is based in Sioux Falls, builds custom electronic circuit boards for companies in the industrial, commercial, medical, energy and heating, ventilation and air conditioning industries.

As president, Larson ensures ESI provides legendary customer service. "We call it legendary services because we want people to talk about the customer service we provide. If we do that, they'll return and recommend us to others."

That passion carries over to STEM education. He coaches his two sons in a robotic league. "It's a great way to get them exposed to the STEM side of the world.

"When looking at trends in education, we're losing some of our edge," continued Larson, who added a master's degree in business administration in 1998 from the University of St. Thomas. "We need to ensure we get as many students exposed to STEM and how STEM impacts life. The robotics club is a lot of fun but it also helps plant some seeds in young minds."



Gene Sieve

The 1990 mechanical engineering graduate became a part of the council this summer to add insight to the college from the perspective of a consulting engineer.

Sieve is regional manager of the Burns & McDonnell office in Minneapolis/St. Paul. The firm is a \$2.5 billion, 5,000-person planning, design and construction firm with offices in more than 35 locations in the United States and abroad. Sieve oversees Upper Midwest operations, including 100 staff in Minneapolis and Duluth, Minnesota; Bismarck, North Dakota; and Sioux Falls.

"I'm honored to get the opportunity to contribute back to SDSU's College of Engineering," said Sieve, who has been with Burns & McDonnell for 15 years.

As a student at State, he was involved in the American Society of Mechanical Engineers and the Joint Engineering Council.

Now he is a registered professional engineer in 10 states, is a LEED (Leadership in Energy & Environmental Design) Accredited professional and past president and past national director for the Minnesota chapter of the American Council of Engineering Companies.

He is a father of three—Kerra, 20; Keaton, 18; and Brynn, 16.



Retirees

The following, listed with their graduation year and position, have recently stepped down from the council.

Jim Morgan, who had chaired the council, resigned after being appointed to the South Dakota Board of Regents April 3. The new chair is Kevin Moe, '88, a second-line manager at IBM.

- **Keith Bartels** '67/'74, retired vice president, Martin Group;
- **Richard Berreth** '58, retired vice president, Haworth;
- **Brian Miller** '93, president, Mechanical Sales Inc.;
- **James Morgan** '69/'71, member, Daktronics board of directors;
- **Leo Reynolds** '69/'71, retired president, Electronic Systems Inc.
- **Jim Wilcox** '76, manager of government and regulatory affairs, Xcel Energy



Engineers honor Wehbe for third time

Nadim Wehbe, head of the civil and environmental engineering department at South Dakota State, was inducted as a fellow of the American Society of Civil Engineers at its national convention in New York City Oct. 11-14.

The fellow designation signifies Wehbe as one of the top engineers in the organization, which has 146,000 members in 174 countries and is the nation's oldest engineering society. Only four percent of the ASCE membership receive the honor.

For Wehbe, it is the third time to be honored as a fellow. In 2014, he was honored by the Structural Engineering Institute, which is an arm of the American Society of Civil Engineers. In 2012, he was named a fellow of the American Concrete Institute.

While it is unusual for one person to be honored by all three institutes, Wehbe said it isn't rare. He called this recognition by his peers "an acknowledgement of one's service and accomplishments in the field of civil engineering."

Wehbe has served on the SDSU faculty since 1998 and has led the civil and environmental engineering department since May 2013, when he was appointed interim head. Following a national search, the Lebanese native became permanent department head in May 2014. As department head, he oversees 15 faculty members and staff, 230 undergraduate students and 49 graduate students.

He arrived at State after performing research in the field of bridge engineering at the University of Nevada-Reno, where he did work in a high-bay structural bay.

Wehbe was instrumental in designing and equipping of the Jerome J. Lohr Structures Lab in Crothers Engineering Hall in 2002. The 34-foot high-bay space, which is 90 feet long and 34 feet wide with 4-foot thick reinforced concrete floor, is the only facility of its kind in the Dakotas.

As lab director, Wehbe has supervised research and structural testing on large- and full-scale test specimens for private companies and government entities for more than a decade. Since 2006, SDSU civil engineering faculty and students have helped solve transportation-related problems as one of eight universities in the Mountain Plains Consortium Transportation Center Program.

Last summer, Wehbe supervised testing of a new method of joining double-tee girders typically used on county and city highways that will enhance the structural performance and extend the lifetime of the bridge platform. The research advisory committee of the American Association of State Highway and Transportation Officials selected it as one of the nation's 16 high-value research projects, known as the "Sweet 16."

"I am always pleased to see the research infrastructure at State continue to serve the needs of our constituencies," Wehbe said. The two-year, \$160,000 project was sponsored by U.S. Department of Transportation through the Mountain Plains Consortium and the South Dakota Department of Transportation. Cretex of Mitchell collaborated with SDSU on the redesign of the new joint system and provided the test girders at cost.

In 2011, he was recognized as the Jerome J. Lohr College of Engineering's outstanding researcher. He became the first recipient of the John M. Hanson Professorship in Structural and Construction Engineering, an endowed position, in 2014.

Board of Regents grants to Tonkoski, Pan



Faculty members Reinaldo Tonkoski, electrical engineering and computer science, and Yunpeng Pan, mathematics and statistics, have earned South Dakota Board of Regents Competitive Research Grant Program awards for Fiscal Year 2016.

Assistant Professor Tonkoski received \$96,200 to continue his work on the development of microgrids that will make it possible for communities and businesses to use locally produced wind and solar energy yet maintain a consistent, reliable power system.

Specially designed controllers with new battery technologies will help maintain consistent power quality and make the energy system more efficient, he said.



Assistant Professor Pan was approved for \$62,038 for "A Decision Analytics Platform with Application to Sustainable Cloud Computing."

From discussions with industry and the Governor's Office of Economic Development, Pan aims to quantify the impact incentives have on data center site selection. His work will review the challenges created by multiple criteria, multiple stakeholders, complex dynamics, Big Data, etc.

Former dean honored

Former dean Duane Sander was inducted into the South Dakota Hall of Fame at a Sept. 12 ceremony in Chamberlain.

Sander, 77, became a professor in the SDSU electrical engineering department in 1967 and retired as dean in 1999. He and fellow faculty member Al Kurtenbach founded Daktronics in 1968. The SDSU Alumni Association honored him in 2002 for distinguished service to SDSU by a non-alum. In 2000, the Jerome J. Lohr College of Engineering selected him as a Distinguished Engineer.

After retirement, he helped found the Enterprise Institute through the SDSU Foundation and continues with angel investing in the state.

He was among nine tabbed for his year's hall of fame class.



Construction and operations management

The SDSU construction and operations management program ranked 39th in the nation in terms of enrollment (256) and 39th in the nation in terms of graduates (66) in 2014, according to the American Society for Engineering Education.

The only regional competitor in these areas is Minnesota State University, Mankato, Associate Dean Richard Reid said.

Math teacher Larsen dies

Betty Larsen, who taught mathematics at SDSU for 28 years, died July 29, 2015, at Oak Terrace Assisted Living Center in Mankato, Minnesota. She was 78.

From 1981 until her retirement in May 2009, Larsen taught freshman and sophomore math classes for 28 years, including college algebra, pre-calculus and survey of calculus. She was educated as an elementary school teacher and went on to get a master's degree in education.

In retirement, she and her husband, Neil, rode horses and kept tabs on their six grandchildren and the SDSU women's basketball team.

Survivors include her husband, of Brookings; a son, Johnny (Denise), of Harrisburg; and two daughters, Lynette (Steven) Bacon, of Mankato, and Lauralee (Will) Barnard, of Paige, Texas.



IN MEMORIAM

Kevin Dalsted

Co-workers recall 'thoughtful, warm' engineer



“Kevin also was blessed with the ability to guide people in a way that allowed each one to find a solution to their question.”

Jon Puetz, South Dakota OSHA Consultation program director with Engineering Extension

Above center: Kevin Dalsted gathers with co-workers and their spouses in this Aug. 24, 2003, photo. Pictured, left side, from front to back, Kay Dalsted, Diane Skorseth, Ken Skorseth and Pat Intermill. Right side, from front, Marty Steineke, Kim Steineke and Kevin Dalstead.

Right: Kevin Dalsted enjoys a good laugh while sitting in his Harding Hall office in about 2000, when he was director of the Engineering Resource Center.

Kevin J. Dalsted, an SDSU faculty member for nearly 40 years, died July 14, 2015, while working with a combine alongside his brothers in Colorado.

Dalsted, 63, of Brookings, began at SDSU in 1977 after receiving his master's degree from North Dakota State University. He worked in the Remote Sensing Institute, the Engineering Resource Center and the Water Resources Institute before retiring in 2014. However, he returned on a part-time basis to work on a project with the Earth Resources Observation and Science (EROS) Data Center.

Dalsted also partnered with his brothers, Galen, of Iliff, Colorado, and Norman, of Fort Collins, Colo., in Dalsted Brothers Harvesting.

Mary O'Neill, temporary remote sensing coordinator at the Water Resources Institute, already was working at the Remote Sensing Institute on campus when Dalsted arrived in 1977 after being educated in soils. In his first job, Dalsted used satellite images to characterize the utilization of soil.

His career evolved into a variety of projects connecting engineering with application, including work with OSHA.

O'Neill called Dalsted “intellectual, witty, humorous and soft-spoken. He was the kind of guy who got along with everyone and was very humble about what he knew and what he did.”

Directed Engineering Resource Center

For many years (1998-2011), Dalsted directed the Engineering Resource Center, the main outreach department for the College of

Engineering. When budget restructuring halted the Engineering Resource Center, Dalsted and O'Neill settled in the Water Resources Institute within the Department of Agriculture and Biosystems Engineering. Dalsted served as assistant director.

Early in his career, Dalsted worked on projects with the U.S. Agency for International Development for Somalia, Jordan, and the West African countries of Botswana, Senegal and Mauritania.

Dalsted made an effort to learn French in order to be able to speak with scientists from the French-speaking countries in West Africa, O'Neill said.

Left his mark in space

From 1991 to 2014, Dalsted also was a member of the NASA South Dakota Space Grant Consortium and was its associate director for the last 18 years. Through that position, he coordinated the SDSU Aviation Career Education (ACE) camp and assisted with Success Academy, an undertaking of Flandreau Indian School and SDSU.

Paul Bezdicek, now a senior sales engineer with Ingersoll-Rand Industrial Technologies in Sioux Falls, was in need of an internship in summer 2005 when he signed on to help with ACE camp.

“He always seemed positive and open to various ideas. He was the closing speaker and gave a real good inspirational talk—‘follow your dreams.’ He was always well received and very positive,” Bezdicek said of Dalsted's talk to high schoolers who spend a week on the SDSU campus.

Winning app

Project wins national contest for IBM interns

Junior computer science major Nicholas Wolter teamed with four other interns at IBM's Rochester, Minnesota, facility to produce an award-winning, Internet-based app for IBM's artificial intelligence computer Watson.

The app created an administrative console for the Watson Oncology Advisor that allows the supercomputer to be customized, Wolter, of Windom, Minnesota, said. The adviser suggests treatments and prescriptions for cancer patients after being given information about the patient, he said.

With the app, doctors can add treatments and pharmaceuticals that weren't included in Watson's information base, Wolter said.

He said the app also provides usage statistics based on the doctor or the hospital. Currently, the Watson team is working with Memorial Sloan Kettering Cancer Center in New York and the computer also is being accessed by a couple other hospitals. IBM has created a business unit around Watson to grow its revenues.

Wolter and fellow interns from Luther College, Iowa State and Drake University were given the assignment when they started their internship in May.

By Aug. 12, they were at Astor Place in Manhattan, New York, to compete against 59 other IBM Watson teams. The Rochester team and one other were the only ones to create an oncology app. The other 58 entries spanned a wide range—from voice ID recognition to Watson news, Wolter said.

In the contest, the teams presented their projects to one another with five teams selected for judging by IBM executives in the finals.

Wolter said judges were impressed that the Rochester team was able to complete and test its project. They cited an instance in which a customer in Scotland wanted to be able to customize its Watson Oncology Advisor, and the Watson representative was able to use the new app to show how it could be done.

The most challenging part of the project was making it accessible for all potential users, including the colorblind and those unable to use the mouse.

Before the internship, Wolter said he had a great deal of experience creating apps, having had an internship after high school that involved programming as well as working as a software engineer for Mutual of Omaha after his freshman year at South Dakota State.

He said the interns were aided by the Watson Oncology team in Rochester, whose offices were adjacent to the interns.

In a little more than a year, it will be Wolter who is assisting the interns. In mid-October, he accepted a job offer to work on the Watson Oncology team after he graduates in December 2016. This fall, he and two other interns worked remotely on the app, which shipped to customers in November.

With that completed, Wolter was switched over to a new IBM team called Clinical Trial Matching, which works along side oncology. He will rotate between the two teams for his summer internship in Raleigh, North Carolina.

Dave Graves

This team of IBM interns from Rochester, Minnesota, received first place at the national competition for IBHeM Watson intern projects in New York Aug. 12. Pictured, from left, are Carrie Fuerst, a senior at Iowa State; Blaise Schaeffer, a senior at Luther; Mike Rhodin, senior vice president, Watson Group; Nicholas Wolter, a junior at SDSU; and Michael Moore, a senior at Luther.

Not pictured is Josh Lee, a junior at Drake.



Fellow members of the Space Grant Consortium management team posted a memorial on its webpage.

“Without a doubt, Kevin enthusiastically helped inspire the next generation of explorers. (In addition), the positive spirit of our management team is a lasting reflection of Kevin's involvement. We fondly remember many quality hours with him on road trips as we would carpool to various Space Grant meetings around the state.

“Kevin was a very thoughtful and warm person with a wonderful dry sense of humor. He will be sorely missed.”

Career grew from family roots

Jon Puetz serves as South Dakota OSHA Consultation program director with Engineering Extension, a position Dalsted once supervised.

He has known Dalsted since the 1980s and worked with him on a couple of large OSHA studies.

“One of his strengths was his ability to communicate with all sorts of people; from those on the front line to top management,” Puetz said. “He would use common stories that we could all relate to like farm experiences, his family or connections with professional colleagues.

“Kevin also was blessed with the ability to guide people in a way that allowed each one to find a solution to their question.”

Dalsted's farm experiences were rooted in Langdon, North Dakota, just 16 miles from the Canadian border, where he was born Jan. 22, 1952.

The Dalsted brothers helped out on the family's grain farm and Kevin, the third of four children, excelled at school. Dalsted was

valedictorian of the Class of 1970, played varsity basketball and participated in FFA. After graduation, he headed to Fargo and earned degrees in soils (bachelor's 1974, master's 1977.)

Interests included woodworking, gardening, music

Dalsted married Kay Ottesen Feb. 20, 1982, in Langdon, and they raised three children—Alisha, Evan and Kyle—in their Brookings home.

As an avid woodworker, he made countless desks, shelves and picture frames for his family. Dalsted enjoyed all genre of music. In the evenings, if he wasn't working in the garden with his wife, he could be found tapping his toes to the sounds from his vintage stereo system with a Coke Zero.

“As dedicated as Kevin was to his work, his family was the most important part of his life,” Puetz said.

Family and friends reflected on his life at a July 20 funeral at St. Thomas More Catholic Church in Brookings. Survivors include his wife, their children, Alisha (Micah) McKay, of Madison, Wisconsin; Evan, of Madison, Wis., and Kyle (girlfriend Erin Harwood), of Minneapolis; a granddaughter, his brothers and a sister, Luann Bauer.

O'Neill summed up the thoughts of many of Dalsted's SDSU colleagues: “It's very tragic. I'm going to miss him a lot after working with him all these years.”

The family requests memorial donations may be made to ACE Camp in care of the SDSU Foundation, Box 525, Brookings, SD 57007.

Larry Leigh
receives

Google Earth Award



It's a first for the SDSU image processing lab and for imaging engineer Larry Leigh. Leigh became the first SDSU researcher to receive a Google Earth Engine Research Award. Through the one-year, \$46,000 grant, he is using Google Earth images to find more sites to calibrate earth-imaging satellites.

Satellites, such as Landsat, measure the amount of energy reflected from Earth, but engineers must routinely calibrate them to ensure the images they transmit are accurate, Leigh explained.

Traditionally, engineers go to the site and take measurements, which they then compare with satellite images of the same site. One such site exists in a field southeast of Brookings. However, these data-gathering excursions are time-consuming and expensive.

Identifying absolute calibration sites

To streamline the process, SDSU engineers have located remote places, such as deserts and dry lake beds, where the surface

properties and therefore the reflectance, do not change over time.

The stability of these absolute calibration sites means any changes in the satellite imagery must be due to the instrument, rather than the subject, Leigh explained. That eliminates the need to revisit the site each time a satellite is calibrated.

"We've always wanted to do an exhaustive search of the entire planet," Leigh said. However, not all of the images are readily available through U.S. Geological Survey Center for Earth Resources Observation and Science, or EROS, in Baltic, and this intensive computational process has been, thus far, beyond the capacity of the SDSU image processing laboratory.

Through this research award, Leigh will have direct access to Google's archives, including EROS images and their cloud computing via the Google Earth Engine.

"This provides an excellent opportunity to find more absolute calibration sites and to develop a working relationship with Google Earth scientists," said Dennis Helder, head of

"This provides an excellent opportunity to find more absolute calibration sites and to develop a working relationship with Google Earth scientists."

Dennis Helder, head of the SDSU image processing lab and associate dean for research





the SDSU image processing lab and associate dean for research.

Expanding calibration capability

Three master’s students began work on the project this fall. Two computer science graduate students are developing the interface with the Google servers. One concentrates on finding calibration targets on the ground, while the other



investigates using what are known as deep convective clouds to calibrate satellite images.

An electrical engineering

graduate student in remote sensing is evaluating the ground and cloud sites and will combine those results into a single calibration platform for the satellite sensor.

Satellites, like Landsat 8, have imaging bands that detect atmospheric water vapor, aerosols and thin subvisible cirrus clouds, Leigh explained. “Because these bands don’t truly see the surface of the earth, ground-based calibration targets cannot be used.” That’s where deep convective clouds come in.

“Deep convective clouds live at around 33,000 feet, are very cold and have a specific and modelable brightness,” Leigh said. Working with NASA’s Langley Research Center, the image processing lab has developed a method to use deep convective clouds to calibrate these nontraditional atmospheric bands.

However, Leigh pointed out, “Unlike well-defined ground calibration targets, these clouds move.” The extensive time required to find these moving targets was a limiting factor.

With the help of the Google Earth Engine, Leigh hopes to automate the identification and calibration process on a global scale, so multiple deep convective cloud-based sites can be identified each day for satellite calibration.

“This will allow us to do a more thorough calibration of satellites, such as Landsat 8,” Leigh added.

Increasing dynamic calibration range

In addition, most of the currently identified absolute calibration sites are in North Africa, which Leigh described as “bright sites that were easy to find visually.” He hopes to find more stable sites, particularly those that are darker than the deserts and dry salt lake beds now in use.

“Having that dynamic range is useful in giving us a better handle on how the satellite is performing across its entire operating range,” Leigh said.

Most satellites are calibrated on a somewhat irregular basis; however, the discovery of more sites may actually make daily calibration possible, he noted.

In addition, Google’s venture into the satellite business may open other opportunities for the two entities to collaborate.

“Both sides are looking ahead,” Leigh noted.

Christie Delfanian

Above from left:

Imaging engineer Larry Leigh measures the light being reflected from sand on the Algodones Dunes in southeastern California.

Leigh, imaging engineer Morakot Kaewmanee and assistant professor David Aaron take readings on the Algodones Dunes, a stable calibration site that can be compared to satellite-based measurements.

Leigh, Kaewmanee (behind Leigh), Aaron and technician Pedro Valle De Carvalho E Oliveira of the Geospatial Sciences Center of Excellence work together to verify their measurements.

FACULTY RETIREMENTS

Eight members of the College of Engineering staff have retired recently, although it was a short-lived retirement for a couple of them.

A snapshot of each retiree:

DAVID GALIPEAU



David Galipeau, left, with department head Steve Hietpas.

An endowed professor in the Department of Electrical Engineering and Computer Science, Galipeau retired Jan. 21, 2015, after 23 years with the college.

He arrived in 1992 and invested himself in photovoltaic research as well as studying alternative power, microsensors and microelectronics.

He became the first Hohbach Endowed Professor of Electrical Engineering at a ceremony Nov. 10, 2011. Galipeau's career was covered in greater detail in the spring 2015 issue of *Impulse*.



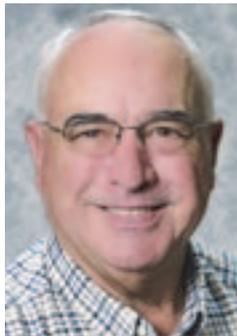
SUSAN GOENS

Goens retired June 21, 2015, after 26 years in the Department of Agricultural and Biosystems Engineering. She spent the first six as a clerk in the weather office and the last 20 as senior secretary.

Career honors include being named Career Service Employee of the Month in March 2000 and receiving the Women of Distinction Award in Career Service in April 2006.

At her retirement reception, Goens cited 19th century French novelist George Sand, who said, "Work is not man's punishment. It is his reward and his strength and his pleasure." She added, "Work here has been a pleasure for 26 years."

Goens and her husband, Rollie, have four children and three grandchildren. In retirement, Goens plans to undertake volunteer work, travel and play with her grandkids.



DON HOSEK

Hosek, a technical assistance provider with the South Dakota Local Transportation Assistance Program, retired in January 2015.

Hosek, of Wagner, served as an engineering consultant on matters of roads and drainage for townships, counties and small cities in southeast South Dakota, a position he began May 1, 2006, after retiring from a 33-year career

with Charles Mix County, where he was highway superintendent.

In retirement, Hosek and his wife, Doris, will winter in Arizona. They have a daughter, Kristine, and two sons, Kelly and Kyle.

ROSS KINDERMANN

Kindermann, a professor in the mathematics and statistics department from August 1988 to May 2015, taught graduate and undergraduate classes in probabilities and statistics as well as a graduate class in operations research in mechanical engineering.

He was co-coordinator of the MathCounts competition for middle school students for all but the first two years of his career here.

Prior to SDSU, Kindermann taught seven years at the University of Nebraska-Lincoln and three years at the University of Tennessee-Chattanooga. He holds a bachelor's in mathematics from Dartmouth College (1972), a master's in statistics (1974) and a doctorate in mathematics (1978), both from the University of Illinois.

Kindermann, a native of Milwaukee, said he is considering a move to Lincoln, but has no other retirement plans.



ANN MONNENS

Monnens served as an accounting assistant in the Water and Environmental Engineering Research Center from January 1991 to May 2015. Prior to that, she served seven months (June 1990 to January 1991) as a secretary in the home economics department.

After taking the summer off, Monnens returned to a position in the University Student Union with the Multicultural/TRIO program Sept. 29.

The Waukon, Iowa, native was the October 2003 SDSU Career Service Employee of the Month. She holds an associate of arts degree from Kirkwood Community College, Cedar Rapids, Iowa.



MIKE MONNENS

Monnens worked as a safety and health consultant with Engineering Extension from January 1995 to December 2014.

Engineering Extension provides engineering assistance for South Dakota companies with their safety and health hazard programs, which entails on-site safety assessments for items like noise, chemicals exposure and machine guards. The work is funded through a federal Occupational Safety and Health Administration grant funneled through the State of South Dakota.

In his career, Monnens inspected hotels, restaurants, manufacturing facilities, construction companies and, especially toward the end of his career, grain elevators.

Monnens came to State in 1990 to earn a degree in ag engineering, which he did in 1993. He worked as a grad assistant in the department from June 1991 to December 1994.

Prior to that, he was a machinist mate in the U.S. Navy from 1969 to 1975 and an equipment sales rep and service engineer in Minneapolis; Algona, Iowa; and Olathe, Kansas, from 1977 to 1990.

Monnens and his wife, Ann, have a son, David, who is in the Peace Corps in Nicaragua. Visiting him is on their bucket list. Monnens also is working part time in parts receiving at Schuneman's Equipment, volunteering at the South Dakota Agricultural Heritage Museum a couple hours a week and catching up on projects at home.

KEN SKORSETH

Skorseth was field services manager and program manager for South Dakota Local Transportation Assistance Program (SDLTAP) from August 1989 through August 2015.

In his role with SDLTAP, Skorseth managed all training and technical assistance services to local transportation agencies across South Dakota. His major interest became low-volume road maintenance, especially gravel roads, and he became a nationally and internationally known expert in the field, working as far away as New Zealand and southern Africa.

Skorseth received the university's F.O. Butler Award in 2005 for exceptional performance by a professional staff member. He co-authored the "Gravel Roads Maintenance and Design Manual" for the Federal Highway Administration published in 2000. Skorseth finished a complete revision of the manual just before retirement and it has just been published.



Ken Skorseth is flanked by Associate Dean Rich Reid, left, and Greg Vavra, Skorseth's replacement, at the National LTAP Conference annual banquet in Savannah, Georgia, July 21, when he received the Lifetime Achievement Award.

Prior to coming to SDSU, Skorseth worked 19 years in the highway, heavy construction and maintenance industry.

Skorseth and his wife, Dianne, of Gary, have a son, Paul, and two daughters, Kendra Brandenburg and Glenda Milton. All of the children are married and the Skorseths have six grandchildren.

His retirement plans include working on his hobby farm, spending more time with his family and serving his church and community.

Skorseth also returned in a part-time role with SDLTAP on Sept. 21 to assist with special projects. He is enjoying retirement but admits "I'll probably never be able to completely walk away from trying to help local transportation agencies. It has been so rewarding to serve them."

DONALD STRUCK



Donald Struck with his wife, Donna.

Struck, an assistant professor in mathematics, retired in May, about a month before his 78th birthday, after an incredible 51 years in the classroom.

He worked with the remedial math program "on and off" for his entire career. Though a nine-month

employee, he still contracted to teach a traditional lecture class in the summer. In his retirement, he will be playing his accordion in nursing homes and assisted living centers.

"I love polka music," he said in an Impulse magazine interview in 2014 when featured for 50 years of teaching at State.

EE Camp

Connections made at inaugural EE camp

Young scholars at the first-ever Electrical Engineering Camp spent almost as much time burning off energy as they did learning about energy.

The Jerome J. Lohr College of Engineering's Department of Electrical Engineering and Computer Science declared on its webpage that it was "NOT offering your ordinary electrical engineering camp" and the department delivered on that promise by also engaging the 19 participants in rock climbing, kayaking, horseback riding, archery and swimming.

Camp director Cory Mettler, an electrical engineering instructor and outdoor enthusiast, said, "It's not uncommon for schools to have such camps, but what made us unique was showing students the campus life. The stereotype of the electrical engineering student is the bookworm. But we wanted to sell engineering as a life that isn't just labs and classrooms."

Based on student comments, the high school students were as impressed with the great outdoors as much as the college labs.

Joseph Ravichandran, a 16-year-old from Naperville, Illinois, near Chicago, said, "Going outside and doing things made it feel like summer and not just sitting in classes."

If he had not come to the SDSU camp, he would have gone to a traditional outdoors camp. When his mom told him about the camp, "it sounded perfect. It blended engineering, which I love, with the outdoors, which is perfect," Ravichandran said.

Recruiting in metro areas

The July 26-31 camp was his first time in South Dakota. "I love South Dakota. It's a gorgeous state," he said, extolling its open spaces. Ravichandran was one of four from Chicago at the camp. Four more came from the Minneapolis area and three from Mettler's hometown of

Rochester, Minnesota, while the rest were South Dakotans.

Another Chicagoan was Eleanor Lay, a 16-year-old from Lincoln Park High School near downtown Chicago. "I really like the open, green scenery; seeing the sunset and the stars. With all the lights in Chicago, you really don't see that."

Dimtri Psomas, a 16-year-old from Rochester, was impressed by the horseback riding and "other fun activities." He wasn't familiar with other engineering camps, but knew he wanted to do physical activities. When Mettler made a presentation in his Mayo High School chemistry class, Psomas' interest was piqued.

He said his mom liked the price. At \$500, "it is one of the cheapest camps there is. Some other places are \$3,000," he said.

Mettler said there was an intentional focus in promoting the camp in areas outside of SDSU's primary market.

He was motivated by the words of a recent alum from Chicago, who said many of his classmates didn't go to college because of the cost at larger universities in that area. "We have as good of a program and we're significantly cheaper. Students are not hearing about SDSU," Mettler said.

In addition to the 10-minute PowerPoint presentation Mettler made to advanced chemistry classes in Rochester, SDSU alums contacted high school counselors in Minneapolis and Chicago.

Camp made learning fun

Lay and Joseph Yousif both heard about the camp through relatives who work at S&C Electric in Chicago. Yousif, 19, has completed a year at Oakton Community College in Des Plaines, Illinois, and will get an associate of science degree. He came to the camp to see if electrical engineering should be the next step.

His summary was short and favorable.

"It's pretty cool. I liked everything, every day; coding, making robots," Yousif said.

In addition to touring campus facilities, learning to solder and touring Daktronics, the students capped their lab time by working in groups of three to make a dawn-to-dusk yard light with a solar cell that powers an LED, Mettler said. They were given components and asked to apply electrical engineering principles they had gained.

So how did the students do?

"The students were challenged by the design problem, but demonstrated understanding of most of the key concepts discussed throughout the camp. Everyone took home a working project and the activity provided us with insight on how to improve the camp for next year," Mettler said.

He is excited about directing the camp again in 2016 and will do even more in-person recruiting. Psomas, one of the Rochester students, expected more campers this year. "I thought there would hundreds of kids here. I hope it grows next year because it's fun."

He said he likes the University of Minnesota, but was impressed by SDSU. "It's a big school, but not a huge school and, wow, they've got a lot of technology here."

Classmate Sam Poppen attended camp to help him decide if he wanted to become an engineer. He enjoyed the people and time spent in the lab building robots and doing coding.

But the camp was by no means his introduction to SDSU. His sister, Hannah, is a pharmacy student. His father, Joel, is a graduate and his uncle, Dennis Helder, is associate dean of research in the college.

Dave Graves



Camps

Jerome J. Loehr College of Engineering

Ready to visit

Come learn about careers in science, technology, engineering and mathematics!

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

DATE: Nov. 14, 2015

LOCATION: Crothers Engineering Hall

The annual all-day session is the high school version of GEMS. It uses professional women and hands-on activities, such as electrical circuitry, electrical consumption and water treatment, to inspire girls to pursue courses of study introduced during the workshop. There also is a separate session to share college information with parents.

COST: \$25, advanced registration requested. Register at: www.sdstate.edu (keyword: ready SET go).

CONTACT: Rich Reid, associate dean for academics, Richard.reid@sdstate.edu, 605-688-4161

TEAMS (TESTS OF ENGINEERING APTITUDE, MATHEMATICS AND SCIENCE)

DATE: Feb. 24, 2016

LOCATION: University Student Union

TEAMS is a one-day national competition that gives high-school and middle-school students an opportunity to discover engineering and apply knowledge. Teams of four to eight students work together to solve real-world engineering problems in a two-part competition, including multiple choice and short-answer essay questions.

COST: \$125 per team.

CONTACT: Kim Prohaska, lecturer, computer science, kim.prohaska@sdstate.edu or 605-688-6268

EASTERN SOUTH DAKOTA SCIENCE AND ENGINEERING FAIR

DATE: March 22, 2016

LOCATION: Frost Arena

An all-day, judged exhibit for middle school and high school students who first compete at their local science fair. Grand-prize winners in the senior category receive an all-expense-paid trip to the Intel International Science and Engineering Fair, held in a new location every year.

COST: No charge to enter, but advanced registration required.

CONTACT: Brad Blaha, science fair director, sdsu_sciencefair@sdstate.edu, 688-5133

GEMS (GIRLS, ENGINEERING, MATHEMATICS AND SCIENCE)

DATE: April 2, 2016

LOCATION: Crothers Engineering Hall

The annual all-day session is designed to stimulate eighth-grade girls to pursue courses of study introduced during the hands-on workshop, which includes robots, bridge building and forensic science. There also is a separate session to share college information with parents.

COST: \$25, advanced registration requested. Register at: www.sdstate.edu (keyword: GEMS).

CONTACT: Rich Reid, associate dean for academics, Richard.reid@sdstate.edu, 605-688-4161.

ENGINEERING EXPO & PHYSICS BOWL

DATE: April 29, 2016

LOCATION: Swiftel Center, Brookings

High school students compete in contests for prizes and bragging rights in such events as human wallpaper, photovoltaic cannon and rocket car. Math and physics competitions also are held. The expo annually attracts about 400 high schoolers from eastern South Dakota, western Minnesota and

Iowa, and eastern Nebraska. It is held in conjunction with the college's senior design project display and competition.

COST: Free, advanced high school registration requested.

CONTACT: Barb Dyer, 605-688-4161, SDSU_EXPO@hotmail.com.

YOUTH ENGINEERING ADVENTURE

DATE: June 19-23, 2016

LOCATION: on campus

The camp allows high school students to discover the world of engineering through tours, demonstrations, hands-on projects and interaction with engineering professionals. Students are divided into groups of 10 and each group works closely with an engineer in their hands-on activities.

COST: Cost: \$100, advanced registration required.

CONTACT: Geoffrey Bonvallet, physics department lecturer, Geoffrey.Bonvallet@sdstate.edu, 605-688-4977

ACE (AEROSPACE CAREER AND EDUCATION) CAMP

DATE: July 2016 (dates not yet selected)

LOCATION: on campus

Sponsored by NASA and hosted at SDSU, this four-day camp provides high school students a look at aviation and aerospace careers. Students will receive two hours of flight and ground training, get behind the controls of an aircraft, build and launch air rockets, look into the workings of a jet engine, explore an F-16 fighter jet and visit with aviation professionals.

COST: \$350, advanced registration required. Tuition assistance up to \$200 available.

CONTACT: Cody Christensen, assistant professor, aviation, Cody.Christensen@sdstate.edu, 605-688-4983

ELECTRICAL ENGINEERING CAMP

DATE: July 24-30, 2016

LOCATION: Daktronics Engineering Hall

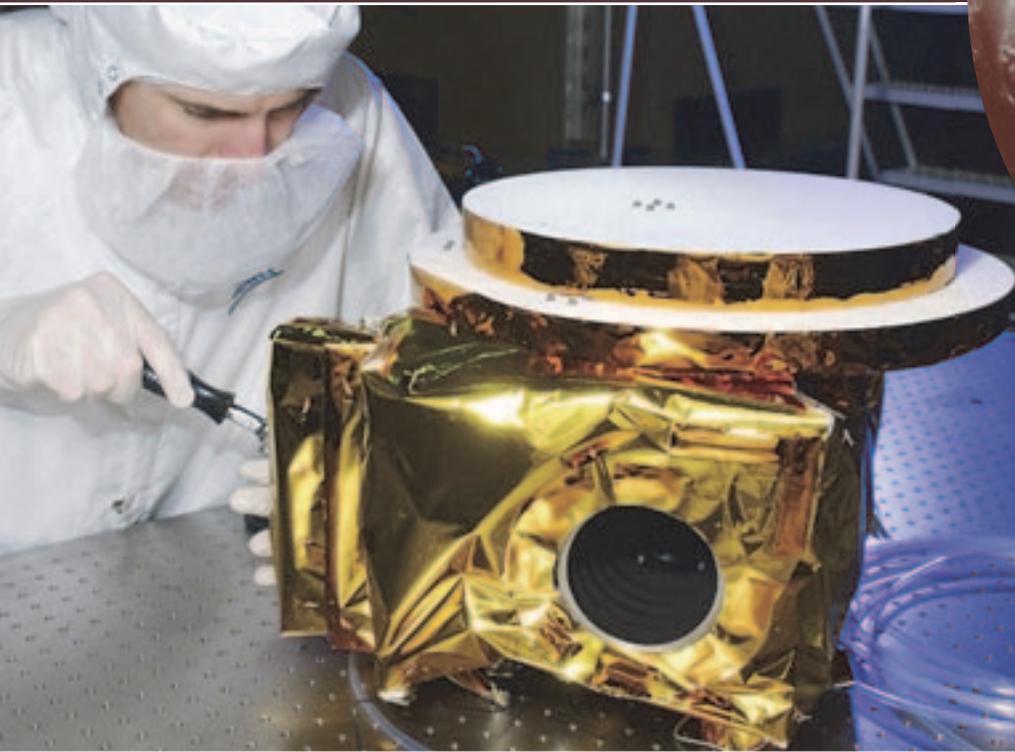
This unique camp combines outdoor adventures with high-tech electrical engineering activities. Designed for students who have completed their sophomore year, the camp lets students create electrical devices, tour engineering facilities on- and off-campus, canoe, ride horseback and undertake other outdoor activities.

COST: \$500, advanced registration required. Register at: www.sdstate.edu/eecs/camps

CONTACT: Cory Mettler, camp director, instructor, electrical engineering, 605-688-5306, cory.mettler@sdstate.edu

Award-winning photos

ME grad Hegge builds camera used in Pluto spacecraft



A Ball Aerospace technician applies final torque to a fastener on the camera for New Horizons in January 2005, a couple months before it was delivered for spacecraft installation. The camera was built in a room 10,000 times cleaner than a typical operating room.

Pluto's status as a planet may still be a subject of controversy in the scientific community, but after July 14 it can no longer be considered an unexplored planet, or dwarf planet, depending on one's view.

On July 14, 2015, the New Horizons spacecraft passed within 7,750 miles of what had long been considered the ninth planet in the solar system and took startlingly clear pictures of the icy orb. The images were captured by a camera built in part by 1995 mechanical engineering graduate Mark Hegge.

Hegge is a principal engineer in the mechanical engineering department at Ball Aerospace in Boulder, Colorado.

The work was a product of 40 engineers, scientists, physicists and technicians—optical, electrical, systems, test, thermal and structural—who designed, built and tested

Ralph in a span of 22 months. Ralph was the name given the camera by Alan Stern, principal investigator for New Horizons and a former associate administrator with NASA.

Ralph and companion camera Alice were both named for the leading characters on *The Honeymooners*, a 1950s TV show.

While Stern, 57, may have been of the Jackie Gleason era, Hegge, 44, is of the era of George Lucas. "He watched the Star Wars movies 50 times," said his mom, Marge Hegge, a retired SDSU College of Nursing faculty member. He also was interested in Legos and had pictures of planets on his bedroom wall.

So it was not surprising to Marge and Ron, an engineer who also graduated from SDSU, that their oldest child ended up working in the space program.

From Bedford to Ball

In his final semester at SDSU, Hegge interviewed with Ball Aerospace, but it wasn't hiring. So he went to work for Bedford Technologies in Worthington, Minnesota. The firm is a leading manufacturer of twist ties and product fasteners. "At the time, they were building machines for the food processing industry that would seal bags and apply wire tags," Hegge said.

But he kept in contact with Ball Aerospace and, after two years, Ball contacted Hegge to see if he wanted to join the firm.

Hegge didn't have to think twice, but he did have to climb a steep learning curve. "There was a lot to learn. It's an incredibly intelligent crew. It's a real honor to be around these tremendously smart people." To learn their language, he took a class in the aerospace engineering program at the University of Colorado.

"I loved it and took another class," said Hegge, who took one class per semester while working full time. He earned his master's in 2003.

Hegge has also worked on the Spitzer Space telescope, an infrared surveying telescope akin to Hubble except it images in the infrared part of the spectrum instead of the visible that has been in orbit for 12 years and is cryogenically cooled, and the Kepler telescope, which was launched in 2009 and is looking for Earth-like planets around stars other than our own.

Ralph brings special challenges

Hegge began working on Ralph in 2003 as part of a five-member mechanical engineering team facing stringent mass and power constraints and a very aggressive schedule.

Built on a tight schedule (22 months from design to final testing), Ralph also had to be constructed to withstand the radiation and thermal environment of 9 ½ years of space flight, be able to function in the low light levels that far from the sun, be comparatively compact and use very little power.

The distance from the sun (more than 3 billion miles) affects both picture-taking and power.

Plutonium is used as the fuel for a radioisotope thermonuclear generator, said Hegge, noting this is traditional for deep space missions. The imager was designed to take pictures with light equivalent of taking pictures only with the light from a quarter moon on Earth.

That meant Ralph was very sensitive to bright light. Therefore, the aperture wasn't opened until the craft was near Mars.

Mass was important because the less it weighed, the faster it could launch and/or the more fuel it could carry, getting it to Pluto faster. Ball engineers produced a camera weighing 23 pounds and using only seven watts of power, which is what a typical nightlight uses.

Lightweight craft excels at Jupiter

While a 23-pound imager seems like an elephant compared to a hand-held digital camera, in the world of spacecraft cameras, Ralph is actually svelte.

The Kepler space telescope is much bigger than New Horizons, which weighs 1,000 pounds and is the size of a baby grand piano. Kepler, which is about the size

of a large SUV, had a mass at launch of 2,320 pounds with 1,240 of that being the spacecraft, 1,044 being the camera and 26 pounds of propellant.

Hegge said, "It's all pretty custom to the application. Ralph had to be light and use very low power while delivering high-resolution images."

Ralph's housing was a precision-machined monolithic aluminum structure that was optimized for low mass, stiffness and dimensional stability over a substantial temperature range. Titanium, molybdenum, inconel and composite materials were also used in parts of the imager and a set of aluminum honeycomb panels were used for the thermal radiator to reject heat to space.

Hegge explained that this is an expanded core of aluminum with thin aluminum face sheets bonded to the top and bottom. The end result is very stiff and low mass, he said.

Another custom feature was an aperture door mechanism designed to prevent contamination and "keep the sun from frying the Ralph detectors," Hegge said.

While Ralph was the star of the New Horizons mission July 14, for much of the trip it was just along for the ride. "Before the Jupiter encounter, which was 13 months after launch, it began taking pictures. Ralph took the highest resolution single image of Jupiter that has ever been taken. New Horizons passed relatively close to Jupiter (1.4 million miles) in 2007. But otherwise Ralph hibernated and was just awakened and tested once a year," Hegge said.

The imager was operated by the Applied Physics Lab at Johns Hopkins University, which built the spacecraft, he said.

Virtually no end to Ralph's work

"We weren't really involved much after launch," Hegge said. No troubleshooting was ever required. After seeing Ralph's early work, Ball engineers thought, "If the spacecraft stays healthy, we're going to have a great mission," he said. That's exactly what they got. "Everyone's expectations were exceeded.

"In my mind, Pluto is a planet, especially after seeing these images with a whole variety of geological features on Pluto's surface. That wasn't expected."

Hegge doesn't claim to be close enough to the astronomical community to know if the images will fuel a debate to reclassify Pluto from its dwarf planet status. He has moved on, working on secret projects with Ball.

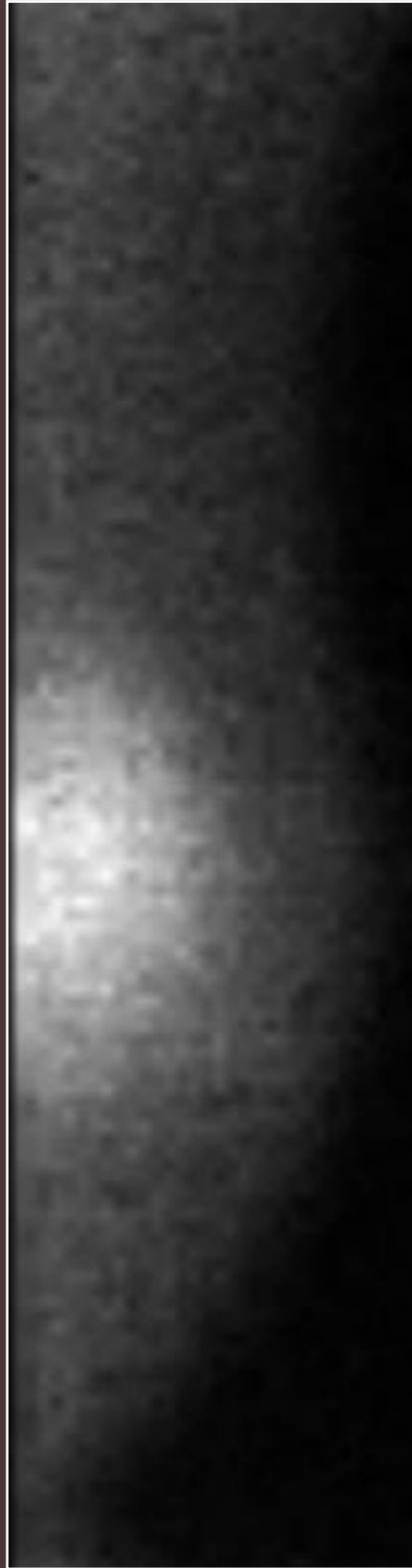
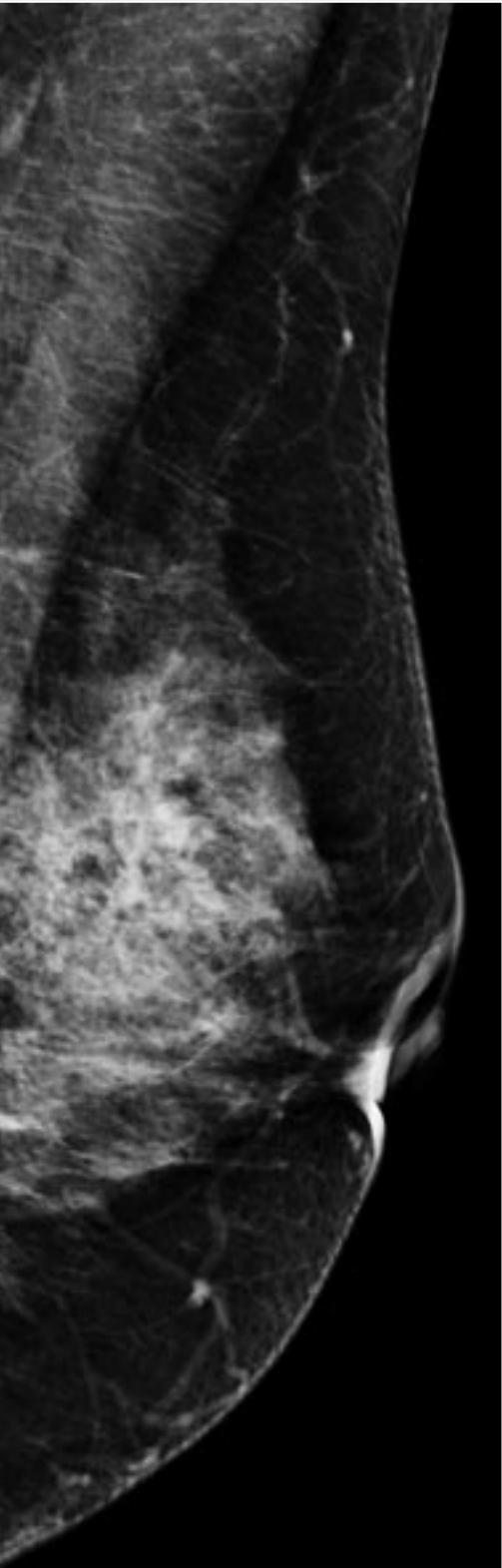
Ralph has moved on, too, continuing into the Kuiper Belt, the third zone of the solar system. "It hopes to find other targets to explore that are like Pluto. It's leaving the solar system and not coming back. A scientist and colleague of mine on the project said, 'In a million years, the pyramids will be nothing but a pile of dust and Ralph will still look exactly like it does now.'"

The plutonium that powers the spacecraft and allows communication to Earth will last for "many decades as we cruise through the Kuiper belt and out of the solar system," Hegge said.

Dave Graves



Mark Hegge holds a scaled model of New Horizons in a July 13 interview with a Denver news station on the day before the spacecraft passed within 7,750 miles of what was long considered the solar system's ninth planet. Hegge '95 works for Ball Aerospace in Boulder, Colorado.



Carrie Hruska

Catching the cancer cells that mammograms miss

When Carrie Hruska '02 graduated with an electrical engineering degree, she never thought she'd have the chance to work with technology that saves women's lives.

But that's what she does.

The Madison native credits much of her success in the biomedical field to one conversation in 1997.

A conversation with Lew Brown '84, dean of the Jerome J. Lohr College of Engineering, was a stepping stone to her career in biomedical research. "When it came time to pick a college major, I found a lot of areas interesting," said Hruska, a medical physicist in the Department of Radiology at Mayo Clinic in Rochester, Minnesota. "I thought about pursuing graphic design or art, or maybe journalism, but math and science fields were most compelling to me."

While touring the engineering facilities, Hruska found Brown in his office. "I was lucky he was in his office that day, because after hearing about some of the student projects, I knew electrical engineering was the path to take," Hruska said.

Hruska said "biomedical" was the new buzzword, when she started in electrical engineering. "Engineering degrees are a nontraditional pathway into the medical field," said Brown, who taught biomedical engineering for years, but stepped down last spring. "It

attracts a different type of student to the college, the one who says, 'I want to do something for health care.'

An important mentor to Hruska was Dennis Helder. "He was so important in my education," Hruska said. "He gave me a chance to try out research in his imaging lab, and I was able to work with some amazing students from all over the world. Dr. Helder taught me how fun research could be when I got down to the important questions."

Role model in the field

While attending State, Hruska looked up to Amy Fowler, one of the few female students in the electrical engineering department at that time. Hruska had never met Fowler but had heard about her success in transitioning from engineering to the medical field.

Fowler '99 is an assistant professor for breast imaging in the Department of Radiology at University of Wisconsin-Madison, School of Medicine and Public Health. "Dr. Brown told me of this current study, Amy, who was pursuing a career in medicine, and I found that fascinating," Hruska said. "It became clear to me that I should choose engineering. I remember him telling me that a foundation in electrical engineering would never fail me in the future. He was dead on." After graduation, Hruska went on to earn a doctorate in biomedical engineering from Mayo Graduate School.

SDSU connection

While attending State, Hruska met her husband, Tim '02, a civil engineering graduate. Because of her position on a computer science advisory board at State, Hruska, her husband and their two children, Isaac (8) and Ellie (5) visit Brookings each year.

She's also writing a breast cancer-related grant with computer science professor Sung Shin. "Mayo is such a large site, and a great place to conduct clinical

research and try new things," Hruska said. "I enjoy staying connected with SDSU through projects like this."

Working at Mayo

Hruska said her job at Mayo Clinic has taken many forms over the past 10 years. She works as a researcher for breast cancer imaging, alongside clinical duties in supporting the radiology practice and teaching at the Mayo Graduate School. "My typical workday is quite a mix. It's a dream job, really," Hruska said.

"My passion is working with our radiologists and other providers to offer the very best imaging tests for patients. In breast cancer imaging, this is a tough challenge, but I am proud that our practice strives to individualize patient testing in order to optimize our detection of cancers, while also minimizing false positive findings and costs to the patient."

Hruska gives technical expertise to advance these goals.

"One day I might be doing routine testing on imaging equipment, but the next day I might be providing data to physicians on the pros and cons of different tests in certain patient groups, or advocating for coverage of new research tests with insurance companies," Hruska said. "I love that I get to do a lot of different things."

Partnering with Fowler

Six months ago, Hruska got the chance to work with her college role model.

Hruska's research team [directed by her physics mentor Michael O'Connor, Mayo Clinic] works to develop and



"I was lucky he (Lew Brown) was in his office that day, because after hearing about some of the student projects, I knew electrical engineering was the path to take."

Carrie Hruska, a medical physicist in the Department of Radiology at Mayo Clinic in Rochester, Minnesota.

investigate nuclear medicine technologies that can image functional behavior of breast cancer. Hruska explained, when a patient is injected with a small amount of radioactive drug, called a radiotracer, it accumulates in cancer cells. This team has established a test called molecular breast imaging, or MBI, as a test that can find breast cancers that are hidden on mammography. MBI is particularly useful in women with dense breasts, which

CONTINUED NEXT PAGE

These images are from a 58-year-old patient who was presenting for her routine annual mammogram, which was read as negative. The mammogram is shown on the left and the MBI exam is shown on the right. As seen in the mammogram, this patient has a lot of dense tissue in both breasts—this tissue appears white (fat appears black). The mammogram was interpreted as normal.

A few months later, the patient mentioned to her doctor that she felt a change in her breast at the time of the mammogram, but she didn't worry about it because the mammogram was normal. An MBI was recommended at that time, which showed a large area of radiotracer uptake in her left breast, which corresponded to a 7 cm cancer. The cancer is located exactly within the island of dense breast tissue and therefore, was not found by the mammogram.

means the breast has a high amount of normal fibroglandular tissue that can hide cancers from detection.

In another area of study, the group is using nuclear medicine testing to tell if a patient is responding to treatment with chemotherapy. “If a woman has a very large cancer, part will respond; likely, the other part won’t,” Hruska said. “The goal is to better monitor the cancer so it can be treated and managed in the best way.”

For a new study that will monitor how estrogen receptors in breast cancer respond to chemotherapy, Hruska’s team has the equipment and Amy Fowler’s lab at the University of Wisconsin has the radiotracer.

Fowler was invited to visit Mayo and present her work on the new tracer Fowler’s previous mentors [John Katzenellenbogen, University of Illinois at Urbana-Champaign, and Michael Welch, Washington University in St. Louis] developed. “We have a breast-sized PET [positron emission tomography] scanner,” Hruska said, noting that the scanner produces 3-D images of the breast tissue and can detect very small tumors. “Because it’s small, we get much higher resolution images compared to our conventional PET scanners for imaging the whole body. This is currently the only unit in the United States so we are excited to try it out. Imaging with Dr. Fowler’s radiotracer would be an exciting application for this scanner.”

Fowler said she didn’t meet Hruska while attending SDSU, but read some of Hruska’s papers. “Our research overlaps, so I knew of Carrie through her work in breast cancer imaging,” Fowler said. “But I just recently had the chance to meet her, and learned that she was also an SDSU grad.”

Their study is looking at how this tracer can be used, according to Fowler. “At the University of Wisconsin, we are synthesizing a tracer that binds to an estrogen receptor and transporting that to Mayo Clinic for the study,” Fowler said the study will scan 20 women over the course of one year.

“It’s a small pilot study with the new high resolution breast scanner, making sure the images produced with the tracer correlate with the estrogen receptor protein,” Fowler said.

Finding the hidden cancer cells

Hruska likes the nuts and bolts and data side of cancer imaging, but at the end of the day, the part she loves most is seeing how the images impact patients’ lives.

“What motivates me to come into work each day is knowing that we are impacting patients’ lives in a positive way,” Hruska said. “With molecular breast imaging, cancers that don’t show up on mammograms, show up on our scans. These can be quite large cancers that have gone undetected on years of conventional screening. By finding these cancers earlier, we can get ahead of the problem, offer more timely treatment, and potentially save women of dying from breast cancer.”

The molecular breast imaging tests—also known as MBI scans—focus on the chemical makeup of the cancer, enabling hidden cancer cells to be detected, according to Hruska.

MBI scans are no longer in the research stage, and at Mayo Clinic, MBI is offered to all women who have dense breasts on mammography. Hruska said this is a controversial issue because for so long many have assumed that mammography screening is the answer. She adds that it is true a mammogram works wonderfully in about half of women who do not have dense tissue, but in the other half, a mammogram would have a hard time detecting cancer because of the dense tissue. “The cancer can hide among that dense tissue year after year,” she said. “This MBI test gives women another look, and it works. We’ve been doing it at Mayo Clinic for 10 years, but other clinics in the U.S. are just adopting it.”

Teaching students, residents

Hruska spends a large amount of her time writing manuscripts and grant proposals. She also teaches students and residents within the nuclear tech and X-

ray tech programs in the Department of Radiology at Mayo. “Writing is such an important skill,” she said. “If you can’t be convincing in writing, then you can’t get the grant money to do the research.”

Hruska said she accepts speaking and presenting opportunities when offered, and encourages students to do the same. “Being able to explain what you are working on is vital in the medical field,” she said.

“Many people with a high level of expertise and intelligence can’t communicate what they are doing in understandable terms,” Hruska said. “I try to teach students that being able to communicate what they do to the masses is what is going to help them excel. If we can’t explain the benefit of a medical practice, then our hard work won’t go anywhere. I tell students, ‘if you can explain this to your grandparents, then you know what you’re talking about.’”

Biggest challenge, also a benefit

Hruska said her biggest challenge is working with a diverse set of personalities, but at the same time, it is also one of the biggest benefits. “We work in an environment with many camps of people who have different ways of looking at a problem,” Hruska said.

“I found that if I can back up a claim with data and results, it resonates better with everyone. One of the hardest phrases for me to hear is ‘this is the way we’ve always done it, and it’s too hard to change.’”

“Personalities can be challenging, but I welcome that because I think different perspectives reap the best answers. And that’s exactly what we want—the best answers.”

Karissa Kuhle

ALUMNI NEWS

Basilio Gonzalez MS '72 died Nov. 7, 2014, as a result of pancreatic cancer.

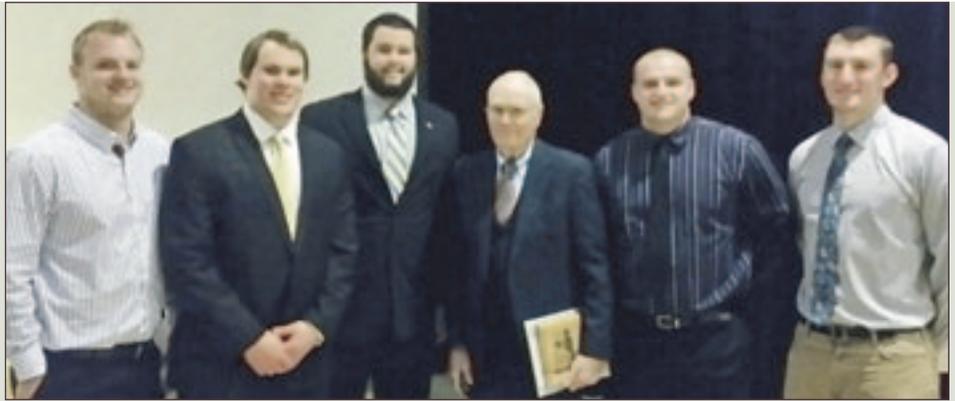
Gonzalez, 82, of Montreal, was a retired consulting electrical engineer. His career included working for the United Nations—teaching in his home country of Spain—and teaching at the university level in Venezuela. His engineering assignments often took him to repair war-torn nations, his daughter reports.

Gonzalez worked into his late 70s and was known to trudge through African jungles as well as climb ladders to inspect equipment in China.

He was preceded in death by his wife of 43 years, Geertje, in 2011. He is survived by children Pablo and Carina and four brothers.

Mark Sternhagen '86/'92 has written the self-published book “Normal For Me” about his life after contracting polio at age 18 months. He went on to earn a bachelor's degree in electronic engineering technology and a master's degree in industrial management as well as a vocational technical teacher education degree from Dakota State.

He taught full time in the electronic engineering technology department at SDSU for 27 years and has continued to teach online classes part time. The book retails for \$10 and is available through Amazon, the SDSU Bookstore and at the website normal4me.com.



Donald Veal, a 1953 graduate of the civil engineering program who played football for four years under coach Ralph Ginn, now poses with current members of the SDSU football team also pursuing degrees in engineering. The occasion was the April 28 Distinguished Engineers banquet, where Veal was honored along with Calvin Vaudrey and Jane McKee Smith. Pictured, from left, are J.R. Plote, an operations management major from Phoenix; Mason Leiseth, mechanical engineering, Hayti; Seth Lansman, mechanical engineering, Harlan, Iowa; Veal; Jacob Ohnesorge, mechanical engineering, Waunakee, Wisconsin; and Mitchell Vejvoda, mechanical engineering, Homer Glen, Illinois.

Duane H. Stuerman '61 died Sept. 16, 2015, at his home in Grover Beach, California.

Stuerman, 77, graduated from Brookings High School in 1956 and earned his bachelor's degree in mechanical engineering. He spent two years in the U.S. Army and in 1963 started a 34-year career with Jostens. He began at Owatonna, Minnesota, and in 1968, at age 30, was transferred to Santa Barbara, California, to be plant manager. He was later transferred to Minneapolis.

After retiring, he returned to California and became a consultant for Intergold, a Calgary, Alberta, jewelry company.

He is survived by his wife, Wanda, two sons, Richard and Michael; five grandchildren, a brother and a sister.

Memorial gifts may be made to the SDSU Foundation for the Duane Stuerman Memorial Scholarship.

LATIF HONORED AS DISTINGUISHED ALUM



Natif Latif, who earned master's degrees in engineering (1983) and agricultural engineering (1985), was among the six people honored as Distinguished Alumni at this year's Hobo Day celebration Oct. 24.

Latif is the chief administrative and academic leader of the College of Technology at Purdue University Calumet in Hammond, Indiana. He is responsible for overseeing seven undergraduate programs and two graduate programs housed in three academic departments in the college.

In that position, he has oversight of 45 faculty and staff, 30 lecturers, 1,000 undergraduate students and 145 graduate students.

In addition, Latif is executive director of the Commercialization and Manufacturing Excellence Center at Purdue University Calumet and has received several federal grants, including one for \$2.74 million from the Department of Labor for workforce development.

Among his honors are outstanding administrative

leader, Purdue University Calumet, 2012, and outstanding alumni of Chittagong University of Engineering and Technology, Bangladesh, 2008. He is a 1977 graduate of the school in his home country. In 2002, he received the Exemplary Service Award from the Association of Technology, Management and Applied Engineering.

He came to U.S. following the path of his childhood friend, who was a chemistry major at State. “He motivated me to come to South Dakota State for its small class size, excellent faculty and affordable living.”

State provided him with outstanding mentoring by his academic adviser and department head.

The transition from Bangladesh to South Dakota was a bit tough because of the weather—from hot and humid to cold, but he quickly adjusted.

“When I came to the U.S., I knew that I would have a better life for me and my family, and at the same time better professional opportunities. During my time at SDSU, I developed a passion for scholarship, research and collegiality that would influence me throughout my career.

“I also started my new life with my wife and then 13-month-old daughter. We saw our first snowfalls and celebrated my daughter's second birthday. It was

an exciting time for a guy in his 20s experiencing a new country and new culture.”

Latif has served 27 years in education, beginning as an engineering instructor at Louisiana State University-Eunice in 1988, and then a professor at Northern Kentucky University for nine years.

He started at Calumet in 2007 after serving as a department head at Purdue University West Lafayette since 1999.

Latif and his wife, Dilara, live in Munster, Indiana. They have two children. Their daughter, Shehreen, and her husband, Neil, live in Peterborough, Ontario. Their son, Mehran, resides in Highland, Indiana.

“During my time at SDSU, I developed a passion for scholarship, research and collegiality that would influence me throughout my career.”



Derek Hengeveld

Marching to his own beat



“I’ve always considered myself an engineer and I do music out of the love for it.”

What’s a satellite thermal engineer doing in a band like this? It’s not a question the percussionist has heard, but it’s certainly one that could be asked.

Derek Hengeveld ’97/’98, a mechanical engineer with a 2010 doctorate from Purdue University, works and lives in Albuquerque, New Mexico, helping develop next-generation satellites thermal control subsystems for the U.S. Air Force and NASA among others.

Hengeveld is the senior engineer in the thermal solutions group at LoadPath, a small, privately owned aerospace-engineering company founded in 2009.

That’s by day. By night, he’s the drummer for Holiday Jam, a creation of Jeremy and

Jonathon Hegg that makes a December tour around South Dakota.

But the Valley Springs native has no problem mixing up his days and nights.

“I’ve always considered myself an engineer and I do music out of the love for it. I have several friends who (are full-time musicians) and they are way more talented than me. Engineering is my day job. Music is my hobby,” said Hengeveld, who had several music scholarships while attending State.

His major was always engineering and his minor is in computer science, not music.

Hengeveld, who was the first four-year all-state band member in South Dakota, played in The Pride of the Dakota’s marching band, The Pride’s drum line, Jazz Band and Symphonic Band. “It kept me on

my toes between engineering classes, rehearsals, performances on the weekends,” he said.

Trained by two of the best

But Hengeveld thrived on the routine and relished the opportunity to further his skills under Jim McKinney, who directed The Pride.

McKinney, an excellent percussionist himself, recalls Hengeveld as “a great percussionist who walked into my office one day along with two other fine drummers from Brandon (Mike Hart and Jason Reigstad). I thought it was a gift from above!

“Derek gave a lift to our entire band program. He was talented but put as much

time in the practice room as any music major.”

At Brandon Valley High School, Hengeveld was tutored by Bob Goheen. “I really landed on two of the best,” he said.

McKinney will tell you he had good material to work with. Both of his parents, Les and Linda Hengeveld, grew up playing drums. Hengeveld started in fourth grade after first having piano lessons. “Percussion appealed to me much more than any other instrument,” Hengeveld said.

He had the perfect set up at home—a drum set and a farm.

“Growing up on a farm was a pretty nice place to be as an aspiring percussionist. My parents were very patient or somewhat deaf. They never complained about me playing. I practiced a lot,” said Hengeveld, who in 2007 was inducted into the Brandon Valley High School Fine Arts Hall of Fame.

ME—music enthusiasts?

At SDSU, in addition to school performances, he paired with Bart Brost '96, another mechanical engineering major, in a couple country rock groups.

Brost and Hengeveld had classes together and then began working as student interns under Mike Twedt at the Industrial Analysis Center, a Department of Energy-sponsored program at SDSU. The since-discontinued program sent Twedt and students to companies to research how their operations could be more energy efficient.

BTU Engineering, an offshoot of the center that Twedt and Hengeveld incorporated, continues to serve South Dakota and Minnesota firms.

Brost and Hengeveld's musical ventures were shorter lived. They were the Mystic Cowboys, a band formed by veteran musician Dan Johnson, who folded the band after about a year. Brost bought Johnson's equipment, added John Hohn and played three years with Hengeveld as Northern Accent.

This would have been during Hengeveld's senior year and during his master's degree studies.

Finding satisfaction in classroom

It also was while pursuing his master's degree that Hengeveld taught classes in the mechanical engineering department. “Teaching was a fantastic experience for me. The students were, hands down, some of the best around,” he said. “I did that for five or six years and realized I really liked the academic world, which is why I went to Purdue to get my doctorate.”

He was an SDSU instructor from September 1999 to 2005 while also working with energy outreach programs through the college.

At Purdue, his research focused on spacecraft and thermal work. That produced an internship with the Air Force Research Lab in Albuquerque, where he worked on projects that went to the International Space Station, got to ride on the zero gravity simulator, met his future wife and landed a job offer from LoadPath.

Music group like family

The firm has accommodated Hengeveld's passions of energy efficiency and music, allowing him to continue with BTU Engineering and his December tours with Holiday Jam. This will be the seventh year for the tour, but it will be without Hengeveld because his wife, Lori, is to deliver their second son in December.

“It will be really hard for me not to be there” because the tour has become a tradition and has the feel of a family reunion.

Most of the group has played together since the tour was created. And longer than that for some. For example, the connection between trumpet player Jim Speirs '99 and Hengeveld goes back to their college years, though it was through their five years of playing

together in Holiday Jam that they got to know one another well.

Speirs said, “Family is a great way to describe it. The group is full of a bunch of world-class musicians, but musicians who care about others and want others to succeed. I have played with enough groups to know that some people are just in the group for what it can do for them, whether that is money or exposure or music leadership.

“In the Holiday Jam group, it truly is a mutual respect. It's a group that really does want to see each other succeed. I'm just as interested in how Derek does on his drum solo as I am with what I do. Some of my favorite pieces have been pieces I don't even play on. I think that's an attitude shared by everyone in the group.”

Creative and disciplined

Hengeveld said music allows him to more fully access his creative bents.

“Music requires creativity. That is one of the prerequisites. With engineering, creativity is not there on a daily basis. I enjoy music. I like the fact of being in the moment. Engineering is more of a slower process. It can take years until you get to the final product.

“With music, to play this song and give it the respect it needs, you have to do that

CONTINUED NEXT PAGE

ABOVE: Derek Hengeveld '97/'98, far right, was part of the SDSU drum line for four years.

OPPOSITE PAGE: Through an internship with the Air Force Research Lab in Albuquerque, New Mexico, he was able to ride in a zero gravity simulator.

OPPOSITE PAGE INSERT: The drummer is a regular in the Holiday Jam tour back in his home state during December, but will miss this year because his second son will be born then.



at that time. I love to perform music and be in the moment. I get to do that with phenomenal musicians whom I would consider world class and consider as my friends,” said Hengeveld in reference to those with Holiday Jam.

While Hengeveld doesn't put himself in the world-class category, he makes sure his performances don't let down the rest of the group.

“If I'm getting ready for a tour, I create a playlist and listen to the tour songs during the day trying to learn the Holiday Jam sets. I listen to those songs over and over. I probably listen to each of them 30 to 40 times and don't get sick of them. When I'm listening to them, I'm thinking how much fun it will be to perform them,” he said.

When he gets home from work, he will rehearse on his drum set, briefly joined by his 2-year-old son, Owen, on occasions.

Mixing music and math

Brost calls Hengeveld a “perfectionist. He was not one to half-heartedly go about something. If you can count on one person being prepared, it's Derek. Being a driven perfectionist, it goes hand-in-hand with being an engineer. People are somewhat surprised that engineers are good musicians.

“But music is a lot of math. It's logic based at its roots. If you look at a keyboard, it's a repetitive sequence.”

The repetitive cycle of life gets interrupted this December when

Hengeveld's second son is born. Eventually the family might like to move closer to home (Lori is from St. Louis). As a “brilliant and innovative engineer,” Hengeveld has the skill set to work in a vast spectrum of engineering settings, Twedt said.

For now, Hengeveld is set on keeping the beat by balancing his worlds and adding another generation of musically inclined engineers.

Dave Graves



JEROME J. LOHR COLLEGE OF ENGINEERING

HOME PAGE www.sdstate.edu/engr

FACEBOOK www.facebook.com/southdakotastateEngineering

YOUTUBE www.youtube.com/user/SouthDakotaState

FIND HELP ON THE WEB

SDSU HOME PAGE
www.sdstate.edu

CAREER FAIR
www.sdstate.edu/engr/career-fair

YOUTH CAMPS
[Jackrabbit BEST Robotics; Youth Engineering Adventure; Aerospace Careers Education; Girls, Engineering, Math and Science; Ready SET (Science, Engineering Technology) Go!]
www.sdstate.edu/engr/camps

ADMISSIONS www.sdstate.edu/admissions

ALUMNI
www.statealum.com

ATHLETICS
www.gojacks.com

FOUNDATION
www.sdsufoundation.org

MUSIC
www.sdstate.edu/mus

SOUTH DAKOTA ART MUSEUM
www.sdstate.edu/southdakotaartmuseum

THEATER
[State University Theatre/Prairie Repertory Theatre]
www.sdstate.edu/cst/sut
www.prairierep.org

Scholarships

Heavy construction scholarships to be awarded spring semester



“SDSU turns out some fine engineering and construction graduates who match up with engineers working anywhere in the country.”

Gary Johnson, president
of A-G-E Corporation
in Fort Pierre

The Beavers, a heavy engineering construction association based in Los Angeles, has funded a new scholarship at SDSU named The Beavers Heavy Construction Scholarship. The group has given \$50,000 to the Jerome J. Lohr College of Engineering to endow the awards.

“In receiving this endowment, SDSU is right up there with some very prestigious institutions,” said Teresa Hall, head of the Department of Construction and Operations Management. “This endowment should generate \$1,000 to \$2,000 in scholarships each year, which will be great.

“We keep hearing about our national infrastructure issues and, for this reason, heavy highway construction is a rapidly growing career field. We need project managers, superintendents and skilled operators—all important to fill workplace demand. We also need civil engineers to design these bridges and roads. With our construction management and civil and environmental engineering programs, this endowment is an opportunity to grow the field. With this endowment, The Beavers expose students to the heavy construction industry and the diverse careers available, in hopes to bring more students into the field.”

Gary Johnson, president of A-G-E Corporation in Fort Pierre, played a large role in connecting The Beavers Charitable Trust with Hall. Johnson was invited to join The Beavers nine years ago, and has been lobbying for SDSU to receive an endowment. “Gary teaches our heavy estimating class each spring because of his extensive experience and passion for the heavy highway construction field,” Hall said. “He was very persistent about SDSU being considered for this award.”

After hearing about the college, Dave Woods of The Beavers made a visit to campus to meet with Hall and tour the facilities in May 2014. “I think that visit to campus made an impression on Dave,” Hall said. “A few months later, we were informed SDSU would be a 2015 recipient.”

Johnson, who is in his fifth year as an adjunct professor for the construction

management program, said he has had the chance to work with a lot of talented students at State. “My sons [Gerad and Andy] graduated from SDSU, and, while working with the South Dakota Department of Transportation, I’ve met many SDSU graduates who match up with engineering professionals who graduate from some of the largest universities,” Johnson said.

The Beavers is a social, honorary organization formed in 1955, and managed by the construction companies and individuals who are or have engaged in heavy engineering construction.

“The university is growing leaps and bounds, and is attracting more students across the board,” Johnson said. “I know the need for scholarships is there.”

The purpose of The Beavers is to:

- Promote goodwill, friendliness and consideration within the heavy engineering construction industry;
- Give recognition to those men and women who have demonstrated particular skill, responsibility and integrity; and
- Encourage and support entry of promising young individuals into heavy engineering construction.

“It’s nice that SDSU is recognized because big schools consistently receive The Beavers’ scholarship endowments,” Johnson said. “In the past, schools like Texas A&M, Oregon State University and University of California, Los Angeles, have received the scholarship—schools that play football on national TV on Saturday afternoons. For SDSU to break into that list of recipients is a really nice touch.”

Scholarships will be available for juniors and seniors in civil engineering and construction management in spring 2016.

“SDSU turns out some fine engineering and construction graduates who match up with engineers working anywhere in the country,” Johnson said. “I am proud to be able to advocate for the students through my membership.”

Karissa Kuhle

DEAN'S CLUB

January 1, 2015 through November 2015

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 significant impact on the college's future. Member names will be listed in the SDSU Honor Roll and the college newsletters. They also will receive invitations to special college and university functions, updates from the college dean, and an SDSU Dean's Club car decal.

3M - Brookings
 3M - Matching Gifts
 3M - St. Paul
 AE2S Industrial LLC
 AGCO Corporation
 Agland Cooperative
 Mary A. Akkerman
 American Council of Engineering Companies of S.D.
 American Society of Civil Engineers Eastern Branch
 American Tower Corporation
 Timothy T. Amert
 Daniel L. and Ginny Amundson
 David A. Anderson
 James M. Anderson
 Marilyn C. Anderson
 Robert M. Anderson
 Roderick B. Anderson
 Applied Engineering, Inc.
 Associated Consulting Engineering, Inc.
 Associated General Contractors of SD-Building Chapter
 ATK
 Umasankar Atluri
 Aurora Cooperative
 Avera McKennan Hospital
 Gladys Bahnson
 Ball Corporation
 Banner Associates, Inc.
 Keith A. and Glynn E. Bartels
 Bartlett & West Engineers Inc.
 Bartlett & West, Inc.
 Basin Electric Power Cooperative
 Beavers, Inc. and Beavers Charitable Trust
 Richard R. Bell
 Gayland J. and Carolyn Bender
 Jay T. Bender
 Justin Benson
 Lyle L. Berg
 Gerald E. and Shirley Bergum
 Richard and Beth Berreth
 Best Robotics Inc.
 Deepak L. Bhojwani
 Kelly L. Biddle
 Bruce E. Bierschbach
 Wayne E. and Jacqueline K. Bletz
 David L. and Cindy L. Bjorneberg
 Black Hills Utilities Holdings LLC
 Charles N. Blackman
 Francis M. and Beverly A. Blaze

Gary L. Bliss
 Lori S. Bocklund
 Boeing
 Duane D. Boice
 Brian A. Borgstadt
 Michael and Vicky L. Bowers
 Steve W. and Jean Brockmueller
 Brookings Economic Development Corp.
 Brookings Regional Builders Association
 Lewis F. and Danelle M. Brown
 Jon R. and Wendy A. Brown
 Curtis D. and Phyllis E. Brudos
 Michael A. Bucher
 Tim and Suzette Burckhard
 Burns & McDonnell
 Robert W. and Linnell Busby
 Ronald J. Bymers
 Edward and Judy Cannon
 CAPITAL Services
 Cargill, Inc.
 Caterpillar Foundation
 Raymond C. Chao
 Chevron Humankind
 David A. and Mary Jo Christensen
 Noel L. and Rita D. Christensen
 Gregg A. Christiansen
 David E. and Barbara A. Christianson
 Robert M. Clark
 Richard A. and Eleanor J. Coddington
 Kurt and Mary Cogswell
 Cooper Power Systems
 James J. Corothers
 Covidien
 Leon D. Crossman
 Allen L. Crowser
 Dakota Digital Inc.
 Dakota Manufacturing Company Inc.
 Dakota Plains Ag Center
 Dakota Provisions
 Daktronics, Inc.
 John K. and Nancy A. Day
 Larry D. De Mers
 Kevin B. and Debra K. De Vries
 Delvin E. and Davonne R. DeBoer
 Glenn DeGroot
 Tate Profflet and Mary J. DeJong
 Arlo B. and Barbara DeKraal
 John T. Denlger
 Robert C. DeVaney
 Jason L. and Jodi L. Devine
 DGR Engineering
 Scott A. Dooley

Dow Corning Corporation
 Neal D. Drefke
 Burdette H. Dugdale
 EAPC Partnership
 East River Electric Power Cooperative Inc.
 Eastern Chapter South Dakota Engineering Society
 Delvin D. and Athene M. Eberlein
 Edinger Brothers Partnership
 James O. and Rita M. Edwards
 Errol P. EerNisse and Sonja Chesley
 Charles P. Eggen
 Electronic Systems Inc.
 Leon B. and Sarah A. Ellwein
 Thomas D. Elverson
 Benjamin J. and Kelli J. Endorf
 Keith A. and Patricia L. Ewy
 ExxonMobil Foundation
 Falcon Plastics Inc.
 Peter F. Famighetti
 Farmers Alliance
 Adolph Fejfar
 Joseph M. Fergen
 Jack W. and Judith A. Finger
 Bruce D. and Debra Firkins
 First Premier Bank - Sioux Falls
 Daniel P. Fischbach and Marjorie Skubic
 Fishback Financial Corporation
 Steve J. Flanagan
 William J. and Twyla M. Folk
 David M. and Shelley R. Frazee
 Daniel A. Friedrichs
 William A. Frier
 Donell P. and Janice M. Froehlich
 Full Circle Ag
 G. A. Johnson Construction Inc.
 Gage Brothers Concrete
 William L. Gamble
 Bill E. Garrett
 Jerome J. and Olimpia Gaspar
 GE Fund
 Glenn S. and Janice C. Gehring
 Traci A. Geller
 Geotek Engineering & Testing Services Inc.
 Regg A. and Barbara J. Glawe
 Mark D. Glissman
 Marlin H. and Shirley K. Goinitz
 Terry L. Gosmire
 Graco Foundation
 Grand Electric Cooperative
 Cheryl A. Greenhagen

Seth M. Greenwood
 Richard L. Gunderson
 Phillip L. and Kristen J. Gundvaldson
 Dale A. and Barbara A. Haack
 Preston C. and Patricia Haglin
 Bruce C. and Cathy M. Hall
 Kurt L. and Dori Hansen
 Michael R. Harms
 John D. Hauge
 HDR Engineering Inc.
 Jerome D. Heeren
 Allen D. and Roxanne Heiden
 Michael R. Heier
 James A. and Sandra L. Hembd
 Henry Carlson Company
 Steven M. Hietpas
 Highwater Ethanol LLC
 Kent L. Hofer
 Wallace J. Hoff, Jr.
 Hormel Foods Corporation
 Burton and Gladys Horsted
 HR Green, Inc.
 IBM - New York
 IBM Corporation
 IBM Corporation - Rochester, Minn.
 Jeffrey L. Ihnen
 Eugene Iverson
 Roger N. Iverson
 Roy L. Jackson
 Dale A. and Diane Jans
 Bruce A. and Debra J. Jennings
 Deloris E. Jensen
 Douglas R. and Colleen F. Joens
 John Deere Foundation
 Johnson Controls Inc.
 Alan C. and Carole L. Johnson
 Corey L. Johnson
 Dean H. Johnson
 Gene A. and Diane Johnson
 Peter S. Johnson
 Matthew C. Jones
 Thomas G. and DeeDee Josten
 John G. Kappenman
 Carmen C. Kasner
 Elizabeth K. Kassing
 M. Thomas and Margaret Kelly
 Michelle M. Kelly
 Daniel C. and Michele A. Kemp
 Virgil D. Kempton
 Kinze Manufacturing
 James F. Kirby
 Shirley F. Klosterbuer

DEAN'S CLUB

Katherine J. Knabach
 Audrey Knofczynski
 Charles W. Knofczynski
 Kenneth D. and Mariys Knuth
 Delores L. Koepsell
 Fritz and Joan Kub
 Aelred J. and Irene Kurtenbach
 Reece A. and Kami L. Kurtenbach
 David L. and LaVonne I. Kurtz
 John A. LaBrie
 Lamp, Rynearson & Associates Inc.
 Larson Manufacturing Company
 Carl E. and Carol C. Larson
 Craig A. Larson
 Darrell D. and Vicki K. Larson
 Ronald J. LaVallee
 Allen E. and Gail Lee
 Dallas G. and Janice M. Lien
 Ralph E. Lindner
 David P. Lingo and Shirley Rapp Lingo
 Dennis R. Little
 Bobbie Lohr
 Jerome J. and Jolene M. Lohr
 William R. and Pamela J. Lohr
 Keith A. Lucke
 Robert W. and Kathleen A. Lytle
 Sue E. Mabee
 Joseph H. and Ellen A. Macek
 John M. Madden
 Lyle P. and Melissa S. Mangen
 James L. and Marvel Mann
 Jack C. and Ellie E. Marshman
 Steve T. Mathison
 Mary P. Mattern
 Michelle L. McCarville
 Richard L. and Karen A. McComish
 Duane L. McDonnel
 K. John McNellis and Paul D. Conrad
 Medtronic Foundation
 James W. and Jo Ann F. Mentele
 Blair A. Metzger
 Brian D. and Ruth A. Meyer
 Kevin L. Micko
 Dennis B. and La Donna Micko
 Microsoft Corporation
 MidAmerican Energy Company
 Glen D. Middleton
 Midwest Glass, Inc.
 Midwestern Mechanical Inc.
 Eugene A. and Debra R. Miller
 Gregory D. and Karen J. Miller
 Tanya L. and Timothy Miller
 Mills Construction Inc.
 John H. and Joy E. Mills
 Harlow J. and Carol Miner
 Minnesota County Engineers Association
 Minnesota Power
 Missouri River Energy Services
 Mitchell Manufacturing LLC
 MJ Aviation
 Kevin L. Moe
 Vaughn K. Jensen and Susan L. Moe

Brian J. and Jamie L. Mundt
 Barbara A. Murphy
 Maynard A. and Sharon D. Nagelhout
 National Association of Home Builders
 Nebraska Public Power District
 Gary L. and Jan R. Nelsen
 Jeffrey L. and Trudiann Nelson
 Stacy D. and Linda J. Nelson
 Allan F. and Bonnie Nereim
 Peter W. Neyhart
 Howard and Norma Nielsen
 Gene A. Ninnemann
 Susan A. Lahr and Gordon D. Niva
 North Central Farmers Elevator
 The Northrop Grumman Foundation
 NorthWestern Energy
 Thomas D. and Marilyn F. Novotny
 Steven F. Oakland
 David C. and Diane Odens
 Douglas A. Oleson
 George W. Olsen
 Gordon W. and Jerilyn Ommen
 Douglas D. and Julie B. Osnes
 Drew J. Osnes
 Otter Tail Power Company - Fergus Falls
 Steven C. and Kathy F. Otterby
 John F. and Linda L. Ourada
 P & M Steel Company
 Steven Rames & Marysz Palczewski-
 Rames
 Ed A. Parkhurst
 Virgil A. Paulson
 Roger D. and Karen Y. Pavlis
 Alan R. and Janice M. Peterson
 David L. and Susan J. Peterson
 Raymond C. and Rose T. Peterson
 Rodney D. and Lisa K. Pierson
 Merle E. Pochop
 POET
 D.W. Proehl Construction Inc.
 Dieter W. Proehl
 Roger N. and Mary J. Prunty
 Tim Purcell Plumbing & Heating LLC
 Robert J. Purcell
 Erik J. Perry and Erika L. Quam-Perry
 Harlan J. and Janice E. Quenzer
 Daniel L. Raap
 Bruce O. Randall
 Randy E. Rath
 Mark W. and Katie K. Rau
 Robert G. Raymond
 Shirley S. Reed
 Tim S. and Mary K. Reed
 Richard A. and Kathy K. Reid
 Robert C. Renner
 Guy F. Rhoades
 Charles W. Richter
 Jon A. and Cheryl K. Rippe
 Fred J. and Ardyne M. Rittershaus
 Les Roberts
 Alan M. and Jeraldine E. Rogers
 Frank and Carolyn J. Roitsch

Dwayne A. and Helen L. Rollag
 Kenneth A. and Mary Margaret Rowen
 Vivian E. Ruch
 Stephen and Karen Rudd
 Ronald A. Rust
 Kenneth C. Rye
 SAIC
 Duane E. and Phyllis Sander
 Lela F. Sandfort
 Sanford Health
 Sayre Associates, Inc.
 Richard F. Sayre
 Vernon R. and Ruth A. Schaefer
 Rodney C. H. Scheel
 Drew P. and Kathy L. Schellpeper
 Paul E. and Kay C. Schellpeper
 Robert C. Schmidt
 Ron D. and Alice M. Schmidt
 Rebecca S. Schmieding
 Allen F. Schmit
 Robert J. Schrag
 Joe H. Schricker
 Donald H. Schroeder
 Brian A. Schuelke
 Richard J. and ReJean A. Schulte
 Ronald D. and Jeanne Schultz
 S.D. Aviation Association
 S.D. Chapter American Public Works Assn.
 S.D. Water and Wastewater Association
 SDN Communications
 Lynn G. Seppala
 Mark S. and Laura Shoup
 Sideline Productions
 Richard E. Sievert
 Sioux Corporation
 Sioux Falls Construction
 Siouxland Chapter of Construction
 Financial Management
 Mark A. Sippel
 James and Joanne Skyberg
 Ernest R. and Jane M. McKee Smith
 Theodore L. Smith
 The Singsaas Family
 Lyle D. and Donna M. Solem
 Ronald C. and Roberta R. Soren
 James L. and Linda J. Spanjers
 Gregg E. and Kathryn A. Stedronsky
 Loren M. and Susan J. Steenson
 Wallace R. Stern
 Dale M. Stevens
 Bruce R. Stordahl
 Clayton L. and Mary E. Storley
 Storm Analysis LLC
 Wayne A. Stowsand
 William J. Strandell
 Noel E. and Lois M. Stratmoen
 Richard A. and Katherine Svanda
 Daryl F. Swanhorst
 LaDell R. and Phyllis L. Swiden
 Tennant Foundation
 Texas Instruments Foundation
 Thomas L. and Susan L. Thelen

Keith B. Thompson
 Thrivent Gift Multiplier
 Jay E. Tolle
 Emil J. Trebesch
 Vernon L. Trimble
 Lynette L. Trygstad
 Wesley G. and Lois J. Tschetter
 TSP Inc.
 Steven G. Turner
 Twin City Fan Companies, Ltd. -
 Minneapolis
 Twin City Fan Companies, Ltd. -
 Brookings
 Donald A. Ufford
 USG Foundation Inc.
 Valero Energy Corporation
 Valley Machining Company
 Van Buskirk Companies
 Myron R. and Joan K. Van Buskirk
 A.J. Van Dierendonck
 Roy E. Van Orman
 Allen M. VandenHoek
 Calvin Vaudrey
 Kathleen A. Vellenga
 Nicholas P. Veverka
 Vernon P. and Cathrene M. Voelzke
 Joseph P. Vogel
 Charles L. and Judith R. Waggoner
 Stuart A. Wahlstrom
 Mark T. and Kathryn A. Walker
 Daniel J. Walkes
 Thomas L. Weaver
 Nadim Wehbe and Haifa R. Samra
 Sharon B. and James R. Weinell
 Larry L. Weiss
 Werk Weld, Inc.
 West Plains Engineering Inc.
 West River Cooperative Telephone
 Company
 David C. Westbrook
 Western Area Power Association
 Stuart A. Wevik
 Shawn M. and Sandra A. Whalen
 Diane M. Wilaby
 Archie D. Wilcox
 James C. and Doniese M. Wilcox
 Ross K. Wilcoxon
 Robert A. and Barbara M. Wilkens
 Joseph D. and Lynne C. Williams
 Sidney P. and Judy Williamson
 Harry W. Willmott
 Norman Andenas and Cecelia Wittmayer
 Terry J. and Michelle L. Wolf
 Walter L. and Sheila Wolles
 Mark M. Wright
 Xcel Energy Services Inc.
 Xcel Energy - Minneapolis
 Stanley J. Zimmer
 Kenneth O. Zoellner

Lohr College of Engineering Continues to Push Ahead



The past six years have included three dedications of new facilities in the Jerome J. Lohr College of Engineering. It started with the first phase of Daktronics Hall in 2009 and the completed building in 2012. Our dedication of the new Architecture, Mathematics and Engineering Building April 24, 2015, was the most-recent milestone for the Lohr College of Engineering.

This state-of-the-art building is a prime example of how multiple colleges and departments work together to develop space that advances the capabilities of South Dakota State University. The departments using this new space—architecture, mathematics and statistics, mechanical engineering and construction and operations management—will be enriched by the thoughtful and collaborative design.

With all of the facility improvements, don't think the Lohr College of Engineering is sitting back and enjoying the good life. Nothing could be further from the truth. The college still has high priorities that will rely upon continued private support.

The SDSU Foundation is working closely with Lohr College of Engineering leadership to develop support for scholarships, an expanded dean's suite to improve the first impression of the college's headquarters, endowed professorships and a fund to support student outreach and enrichment.

Five months into my position as development director for the Lohr College of Engineering, I am eager to meet all our engineering alumni and learn more about their interests at SDSU.

Like you, I earned my engineering degree from SDSU. I am humbled by the opportunity to help further advance the college in my new role. The last 21 years working in business development at Daktronics clearly illustrated to me the value of a strong partnership between the Lohr College of Engineering and its graduates.

Thank you for your support of the Lohr College of Engineering. I look forward to meeting everyone and working with you to pursue our goal of providing a first-class education and create the next generation of leaders in engineering and technology.

Tom Becker

Development Director—Jerome J. Lohr College of Engineering

SDSU Foundation

605-695-9250

tom.becker@sdstatefoundation.org



SOUTH DAKOTA
STATE UNIVERSITY
FOUNDATION

SDSU Foundation
815 Medary Avenue
Brookings, SD 57006

IMPACT *Greatness*

www.sdstatefoundation.org

IMPACT the Future with a simple stroke of the pen

SDSU supporters, like you, often tell us,
“I wish I could do more.”

You can.

Learn how you can impact students now
and in the future by including SDSU
in your will or estate plans.

For more information, contact the SDSU Foundation, Office of Gift Planning
at 888-747-7378 or giftplanning@sdstatefoundation.org.



TODD, ME95

INFINITE OPPORTUNITIES TO **IMPACT THE WORLD**



www.daktronics.com



DAKTRONICS



South Dakota State University
JEROME J. LOHR COLLEGE OF ENGINEERING
Crothers Engineering Hall
Brookings, SD 57007

NON-PROFIT
US POSTAGE PAID
BROOKINGS SD
PERMIT 24

RETURN SERVICE REQUESTED

9,750 copies of this publication were printed with financial support of alumni and friends EG001 11-15

2015 Hobo Day Parade

