

Dear alumni and friends,

We are ending another successful academic year, and our engineering, science, and technology graduates are finding excellent opportunities throughout the state, nation, and world. Everyone in the College of Engineering is proud to see these people complete one of our degree programs and begin their careers. Our individual faculty and staff each contribute to the student experience at SDSU, and their dedication is always mentioned and appreciated by our graduates and alumni. It has been a pleasure and an honor for me to work with these outstanding people, as well as our students, for the last thirty-two years.

As is evident in the articles in this issue, we have world-class research, instruction, and outreach programs in our College. This is exciting for our faculty, as well as for both our undergraduates and our graduate students. In addition, we are seeing more career opportunities in South Dakota, not only for

our graduates, but also for our returning alumni. If you are looking for an opportunity to return to South Dakota, please note the page five article on companies looking for engineers and technical people. We would like to see you back in South Dakota.

Progress is continuing on the Crothers Engineering Hall renovation and addition. The firm of HDR, Inc. is helping us develop design criteria at this time. When the criteria package is completed, we will advertise for bids from design-build firms or organizations. We anticipate that construction will begin in 2000. It is great to see the process now moving toward construction.

As this is my last letter to you through this publication, I want to thank each of you for your interest in and support of the College of Engineering. It is gratifying to me and my colleagues throughout the College that you continue your interest and support of our programs. Be sure to stop in and see what we are doing when you are nearby.

Sincerely,

Duane Sander, P.E., Ph.D. Dean of Engineering, retired June 30, 1999



The SDSU team took first place at the regional concrete canoe competition in April. Page 22



ERC

Engineering Resource Center (ERC) is the College's major provider of outreach services. Page 10

About the Cover

Electrical engineering students Brian Schuldt (left) and Neil Burghardt characterize the electrical properties of ceramics in SDSU's state-of-the-art Microelectronics and Materials Laboratory.

Cover photo by Frank Robertson of SDSU's Instructional Technologies Center.

■ Impulse

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AGC

The members of SDSU's student chapter of the Associated General Contractors of America (AGC) had a great time and made some good contacts at the ConExpo/ConAGG Exhibit in Las Vegas, Nevada, this March. Page 20

College of Engineering
South Dakota State University

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Neil Burghardt



Brian Schuldt

a unique opportunity

When is a part-time job more than just a job? Engineering students working on research projects will tell you that they're earning more than money—they're broadening their knowledge and gaining valuable experience.

Undergraduate students at SDSU get research experience that many institutions only allow their doctoral candidates. "This gives them a tremendous edge, especially in research fields or product research and development," said Lew Brown, associate professor and head of electrical engineering.

Undergraduate students and some master's students handle the bulk of hands-on research activities for Brown's electrostrictive ceramics and ferroelectric polymer research, which he conducts with chemistry faculty members John Fitzgerald and Jay Shore.

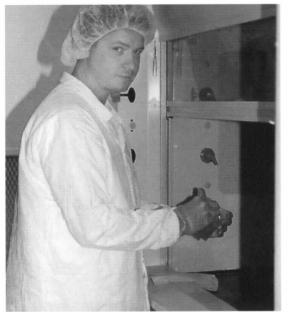
The research focuses on the applications and properties of these materials, which are

useful in ship and submarine sensor equipment and in the medical ultrasonics industry. The materials are synthesized and processed into pellets so their properties of interest can be categorized, Brown said.

The research has been funded by the United States Navy since 1996. Brown recently received notice that the project will be funded for another two years.

Brown depends on students to handle much of the research, such as conducting experiments and collecting data. "We would have nothing without their help," Brown said. "Plus, they get good technical and scientific experience."

Senior electrical engineering majors Brian Schuldt and Neil Burghardt said that their research work has broadened their education. This work has given them the opportunity to apply what they have learned in the



classroom, plus some extra knowledge. "You never learn everything in the classroom," Schuldt said.

Research often prepares students for employment after graduation. "They have a responsibility," Brown said. "They get an office and keys. They're held accountable. There's a lot of trust because they must work with minimum supervision."

Burghardt agreed that the job is beneficial beyond the scientific aspects. "I will draw on this experience in the future. This was my first real job experience," he said.

In addition to work experience, this research provides a thesis topic to students interested in obtaining a master's degree. "Traditional master's degree students start from ground zero," Brown said. "These students can jump right into the work part of

The benefits for the students are obvious, but most engineering schools do not depend on undergraduates to handle their research work. Does this affect the quality of research?

their master's."

"Typical Ph.D.-granting institutions look down on undergraduates for research. They don't view them as a resource," Brown said. However, undergraduate students have been an available resource at SDSU, and the research has not suffered.

"Our level of funding and the public record speak for themselves," Brown said. "In ferroelectric polymers, SDSU is well-known."

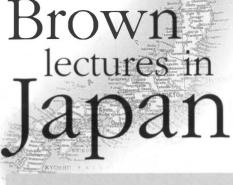
In fact, many of Brown's colleagues from other institutions have been continually impressed by the caliber of his students. Three years ago, Brown and several students attended the IEEE Ultrasonics Symposium in Seattle, Washington. All of the students presented papers on their research activities. A colleague of Brown's from the

University of Illinois asked him if any of his "Ph.D. students" would be interested in working for him.

Needless to say, SDSU undergraduates can hold their own when it comes to research. In the last five years, students have co-authored twelve refereed journal articles and presented thirty-three papers. "That's quite unheard of," Brown said.

With that kind of success, the University can continue its cutting-edge research while giving undergraduates a head start on their careers, Brown said. "It's a win-win situation."

Kraig Mitzner, a May 1999 electrical engineering graduate, began conducting experiments in the Mircroelectronics and Materials Laboratory as an undergraduate student.



Lew Brown, associate professor and head of electrical engineering, is proving himself a truly international scientist and scholar.

During a visit to Japan last October, Brown presented the findings from his ferroelectric polymer research. In addition to lecturing at the IEEE Ultrasonic Symposium, he spoke at Yamagata University in Yamagata and the Kobayashi Institute of Physical Research in Tokyo.

Brown was invited to the Kobayashi Institute by Dr. Echii Fukada, a former student of Professor Kawaii, "the father of ferroelectric polymer research." Brown and Fukada met five years ago through their mutual research interests, and Brown was delighted to have an opportunity to visit his colleague. "It was a real honor for me to do this." Brown said.

He hopes that his visit will pave the way for more collaborative

relations with Japan. Some cooperation already is underway, since Brown's research team is characterizing and testing some of the newest electronic sensor materials from Japan. "This is a unique opportunity to get the first look at these new materials," Brown said.

Brown plans to return to Japan to continue opening doors for research.



Galipeau named Researcher of the Year



Engineers are very practical people. Not content to learn just for learning's sake, they like to employ their knowledge to create something functional. "Applying knowledge to make useful devices," is the way David Galipeau, associate professor of electrical engineering, describes it.

Galipeau has been so successful at applying knowledge to make useful devices, and teaching his students to do the same, that he was named Researcher of the Year at the College's Distinguished Engineers Banquet.

"It's nice to be recognized for your efforts," Galipeau said. But he shares the credit with others. "A lot of people helped me win this award," Galipeau said, "including my students, our department head, and the College and University administration."

Galipeau's research has focused on the development of microsensors for measuring environmental parameters such as humidity, hazardous gases, and biological pathogens. "The idea behind a sensor is to convert some quantity you want to measure into an electrical signal," Galipeau said.

Anything that can be seen, heard, touched, tasted, or smelled can be measured by a sensor.

"There are limitations to the senses of the human body, so we tend to improve on those with our sensors," Galipeau said. "For example, the human body can give some measure of humidity, but it can't give us as precise a measurement as an electronic sensor can. Our

poisonous, so we want to be able to detect them before we can smell them. An electronic sensor can do just that."

The first step toward achieving that goal is to design a microchip that can detect whatever you want to measure. "We actually can make the sensors in our stateof-the-art microelectronics lab," Galipeau said. "Our most exciting area, in terms of being state-of-the-art, is microelectromechanical systems. That involves combining micro, mechanical, and electrical structures on the same computer chip."

Galipeau said that developing devices with a novel design, such as the microelectromechanical systems, is one of his research goals. Research continues to lead to sensors that are not only smaller than those in the past. but which also perform better and cost less. "That benefits both industry and society in general," Galipeau said.

Successful research would be impossible without the hard work of student research assistants. Since he joined SDSU in 1992, Galipeau has employed nearly two dozen students, undergraduate and graduate, as research assistants. He enjoys working with them.

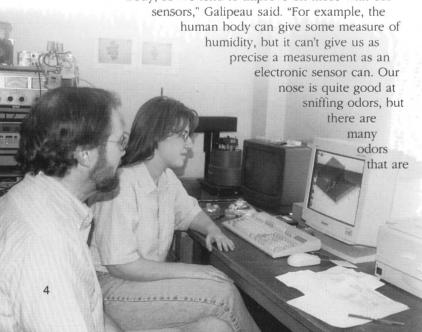
"They are usually enthusiastic and want to learn," he said, "and they are highly motivated, which makes them fun to work with."

The students work together with Galipeau to develop the experimental plan for a research project. "Then they do the real work," Galipeau said. "They do the laboratory tests and experiments. My job is to provide some of the ideas, the funding through grant applications, and the direction for the research."

Both Galipeau and his students benefit from their working relationship. "The students learn a lot," he said, "because they're doing things they've never done before. In research, you learn by doing, as opposed to hearing a lot of theory. Actually doing is the best way to learn. I benefit from the relationship because I have bright, creative people working with me on these projects."

The College's lack of a doctoral program, Galipeau says, offers undergraduate and graduate students ample opportunity to assist with research. "There's probably more opportunity here than at a larger school," he said.

Most of the funding for that opportunity has come from National Science Foundation grants and from the state of South Dakota.



Come-home companies

This is the first installment of "Come-home companies," a series that will feature South Dakota businesses interested in biring engineers.

DynaMark growing in Brookings

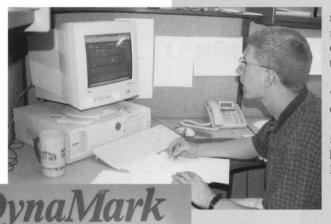
DynaMark employee Dell Poppinga, a 1992 SDSU civil engineering graduate, likes the fact that, "There is a city feel to the company, yet it's in small-town South Dakota."

The computer software company has a city feel because it's based in St. Paul, Minnesota, where it employs a staff of 500. While only eighteen DynaMark employees currently work in Brookings, plans call for that number to rise to fifty by 2001. "It's a company that's looking to grow," Poppinga said. "It's a company that's moving forward."

Dynamark, which works with clients to develop database solutions for direct-marketing companies, generated \$45 million in revenue for 1998. As that number increases, DynaMark's expansion will provide the opportunity for more SDSU graduates to live in Brookings.

Rod Otten, team manager at the Brookings office, said that while no marketing positions are available in Brookings, the company is hiring college graduates with computer backgrounds.

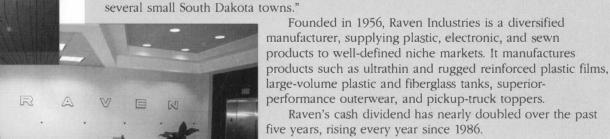
Those interested in learning more about the company or applying for a position may contact Otten at (605)696-5504/ RodOtten@DynaMark.com or Poppinga at (605)696-5514/ DellPoppinga@DynaMark.com.



SDSU alums find home at Raven

Raven Industries has a strong connection to SDSU. The majority of its fifty engineers are State grads, as are three of its five division managers and its president and CEO, David Christensen. The Sioux Falls-based company employs 1500 people at nineteen different sites, including Salem, Beresford, Parkston, Delmont, and Huron.

Gary Conradi, vice president for corporate services, said, "Raven is the eighth or ninth largest employer in Sioux Falls and also has a big positive impact on the economies of



SDSU engineering grads interested in relocating to South Dakota may call Raven's Barbara Ohme at (605)336-2750 or 1(800)424-3484. Raven is primarily interested in electrical engineers, but also hires mechanical design engineers and industrial engineers.

College 11ews

Sander bids farewell to College

Amid a crowd of well-wishers and much good-natured joshing, Duane Sander, dean of the College of Engineering, got a proper sendoff at his retirement reception on April 8.

Friends, colleagues, and students turned out in force to congratulate the dean and drop off some memorable gifts. Of course, there were the gag gifts, such as a "Norwegian chainsaw," and the traditional gifts, such as a gold watch. But none of the gifts were more special than the scrapbook of notes and letters compiled by the College.

Colleagues, friends, alumni, and students submitted items for inclusion in the scrapbook. Their letters praised Sander for his dedication to the College and the University, his commitment to statewide economic development, and his sense of humor.

"Thank you for your thirty-two years of dedicated service to South Dakota State University. You have served with distinction as faculty member, department head, acting dean, and dean," wrote Carol Peterson, vice president for Academic Affairs. "Your excellent work over the years has been both a credit to you and SDSU."

President Emeritus Hilton M. Briggs remembers Sander when Daktronics, the company the dean co-founded with Al Kurtenbach, was in its infancy. "I so well recall the visit of you and Al about taking time from your campus posts to put more time in Daktronics—the headquarters of which was then a twocar garage. Later you returned to us full-time and subsequently advanced to the post of dean. It has been a great satisfaction to those of us that have watched you to see your great professional growth and your many contributions to students, the University, the City of Brookings, and to South Dakota. You have had 'the Midas Touch."

Sander's accomplishments in higher education have been noted beyond SDSU. Ted Muenster, president of the University of South Dakota Foundation, wrote, "Thanks for all you've done for higher education in South Dakota."

Many people outside of engineering higher education also

realize the importance of Sander's relationships with the industry and economic development.

Jack Marshman, president of Sioux Falls Construction, wrote, "I have appreciated your cooperative attitude toward industry in general, and the construction industry in particular. South Dakota will benefit in the future from relationships and programs you have developed."

Marshman added, "I do think, however, that you should have a structural engineer check out the gazebo in your backyard. It's a very nice gazebo, but I can't figure out for the life of me how it stands up."

Donald Patrick, executive director of the Brookings Economic
Development Corporation, wrote, "Having had the opportunity to work with you as a Ron Reed Economic Development Center Board member has been a special time for me, and I think you also. As a founding member of that group in 1986, you again dedicated yourself to a concept that has proven highly successful."

Many people had kind words for Sander upon his retirement, but none more than the College faculty.

Dwayne Rollag, professor and head of civil and environmental engineering, said, "Your leadership, administrative skills, and professionalism are going to be missed in the College. Your genuine concern for people has enriched and improved the lives of us all."

Darrell DeBoer, professor and acting head of agricultural engineering, has appreciated Sander's diplomacy. "The Engineering College has prospered under your competent leadership," DeBoer wrote. "You fostered unity and harmony among the departments through your insight and understanding."

No scrapbook would be complete without a selection of humorous anecdotes. Sander's colleagues provided memories worthy of a few chuckles.

Hans Graetzer, professor emeritus of physics, wrote, "I appreciated your willingness to make a class visit to my introductory physics course even after you became dean. I still remember you talking about hospital electrical safety, and if the outlets were not properly grounded, the cleaning lady with her floor buffer could cause excess current to a heart patient's pacemaker."

Maurice "Murph" Monahan, professor of mathematics, sent a letter that illustrated what Sander has proven: you can be a dean and a nice person. Monahan wrote, "Shortly after you were appointed acting dean, I happened to run into the late Dean [Ernest L.] Buckley. I remarked that I was glad to hear of your appointment, stating that you're such a nice guy. The good dean replied, 'That's the only thing that worries me.'"

Sander named South Dakota Engineer of the Year

Talk about going out with a bang.
As his retirement approached,
Dean Duane Sander was named
South Dakota Engineer of the Year
by the South Dakota Engineering
Society (SDES).

Sander was nominated for the state award by the Northeast Chapter of SDES. Jack Little, chapter member, said criteria for nomination include engineering achievements, civic activities, and involvement in SDES and the National Society of Professional Engineers.

Serving as dean of engineering, co-founding Daktronics, and staying active in engineering societies, from local chapters to national organizations, all contributed to Sander's award, Little said.

Three faculty members retire



Dwayne Rollag

Head of the Department of Civil and Environmental Engineering, Rollag retires after thirty-four years at SDSU. He first came to the University in 1960 as a graduate assistant to professors John Andersen and Jim Dornbush. He joined the faculty as an assistant professor in 1965 and has been department head since 1979.

Following retirement, Rollag plans to pursue the activities he most enjoys—golfing, reading, and traveling. His wife, Helen, will retire from the Dairy Science Department, as well, and they intend to spend some time visiting their three daughters: Susan in Corpus Christi, Texas; Mary in Sioux Falls, and Lisa in Mishawaka, Indiana.

Rollag received his bachelor's degree from the University of Minnesota in Minneapolis, his master's from SDSU, and his doctorate from Purdue University in West Lafayette, Indiana.

"When I look back on my years at SDSU, I realize how fortunate I have been to have truly enjoyed my job and all the students, faculty, staff, and administrators I have had the privilege to know and work with," Rollag said. "I'm going to miss this place."



Maurice "Murph" Monahan

For someone who said that teaching was not his first career choice, Monahan, professor of mathematics, has greatly enjoyed his forty-three years in education. After graduating from SDSU in 1956, Monahan became a graduate assistant in the College and developed a love of teaching. He returned to SDSU after obtaining his master's degree from the University of Illinois in Urbana.

Though he and his wife, Patti, intend to stay in Brookings, they plan to travel around the country. Some of those trips will be to see their three children: Mike in Rapid City; David in New York City, and Sue in Omaha, Nebraska.

In addition to traveling, Monahan has plenty of other plans. He will continue with his music—he plays saxophone, vibraphone, and clarinet—and learn to play the flute. Also, he plans to devote more time to genealogy.

However, Monahan will not vanish from the College. He intends to volunteer as a tutor and substitute teacher. Quitting cold turkey would be difficult for Monahan, who said, "I have thoroughly enjoyed my career and colleagues."



M. Nadim Hassoun

Hassoun, professor of civil and environmental engineering, officially retires this summer, but he may return next semester to teach a class or two if a replacement is not hired. Having spent nineteen years at SDSU, Hassoun and his wife, Seham, will stay in Brookings.

He intends to stay active in the National Society of Professional Engineers and in Professional Engineers in Education. He also plans to do some consulting and to finish writing a new book.

Despite his rather full schedule, he and Seham also hope to visit their three children: Marwan in Ames, Iowa; Soha in Boston, Massachusetts, and Marwa in Minneapolis.

Hassoun received his bachelor's degree from Cairo University in Egypt and his master's and doctoral degrees from the University of Michigan in Ann Arbor.

He has appreciated Rollag and retired Dean Duane Sander's support through the years. "I have enjoyed the people and my colleagues, as well," he said. "I have good memories here."



Shu-Tung Chu

Chu, professor of agricultural engineering, has come a long way from his birthplace of Shanghai, China, and more travel may be in his future. However, he plans to spend most of his retirement in Brookings, the town he has called home for more than thirty years.

Chu joined the SDSU faculty in 1967. Prior to that, he was an instructor at the University of Minnesota, where he earned his master's and

doctoral degrees in agricultural engineering. His bachelor's degree is from National Taiwan University in China.

While Chu and his wife, Alice, look forward to the less structured days of his retirement, they also have fond memories of his long association with the College of Engineering. "I will miss the working environment and the colleagues," Chu said.

Distinguished Engineers bonored at banquet

The College of Engineering bonored three alumni—Paul G. Cummings, Harlow J. Miner, and Bruce L. Miller—as distinguished engineers at its annual banquet in February.

Paul Cummings graduated from SDSU magna cum laude in 1950 with a bachelor's degree in electrical engineering. During his thirty-seven years with the General Electric Company, he was instrumental in development of the brushless synchronous motor, the brushless synchronous generator incorporating solid state voltage regulator systems, and the mathematical models for calculating the translient performance of A-C motors and generators on digital computers.

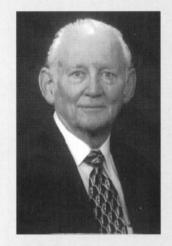
Following his retirement in 1986, Cummings became an independent consultant. He worked with the Electric Power Research Institute (EPRI) in developing and teaching a continuing course on motors, motor drives, and motor applications.

Harlow Miner earned his bachelor's degree in mechanical engineering from SDSU in 1958 and joined the graduate student training program at Westinghouse Electric Corporation in Pittsburgh, Pennsylvania. After assignments in Pittsburgh and Philadelphia, he joined the Aviation Gas Turbine Division in Kansas City.

In 1960 he transferred to the Mechanical Engineering Department at the Westinghouse Defense Center in Baltimore. He designed and tested the cooling system for a large shipboard radar system and was involved in the design, development, and production of a number of ground tactical surveillance radar systems for the U.S. military and foreign military sales. He was a member of the teams that designed and produced a number of the current air traffic control radars. Miner retired from Westinghouse Electric Corporation in 1994.

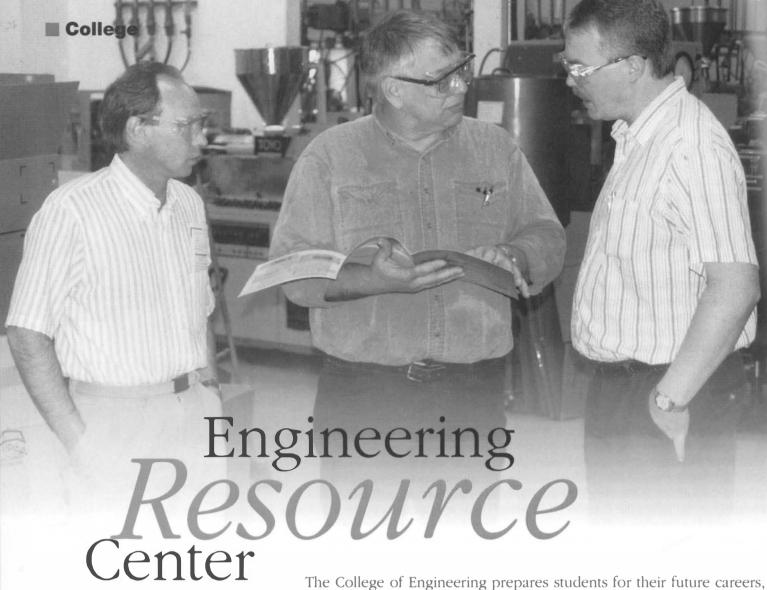
Bruce Miller graduated from SDSU in 1947 with a bachelor of science degree in physics and mathematics, having interrupted his college work for a year to work as a junior physicist on a government war research project at the University of Iowa. After graduaton, he returned to the military for two years, at which time he completed an advanced course in electrical engineering at Rutgers University. He later earned his master's degree and doctorate, both in physics, from Kansas University.

Miller joined Sandia Corporation in New Mexico and did research on assessing weapon's effects from nuclear detonations. After two-and-one-half years with Sandia, he accepted a full-time teaching position in the SDSU Physics Department. Several years after retiring in 1988, Miller began tutoring university and high school students.









provides outreach services



Kevin Dalsted

but that is not all it does. Being a land-grant institution imposes additional outreach responsibilities upon the College, and the Engineering Resource Center (ERC) is the College's major provider of outreach services.

Outreach is an integral part of the College's mission, said Kevin Dalsted, director of the ERC. "Our outreach serves South Dakota's businesses, industry, and government," he said. "It encourages practical integration of engineering, business principles, science and technology, which enhances local, state, and regional economies. We are here to help South Dakota businesses and government succeed in meeting their goals."

Six main activities fall under the ERC "umbrella": the University/Industry Technology Service (UITS), the Essential Networking and Training for Entrepreneurship (ENTRE) program, the South Dakota Space Grant Consortium (SDSGC), the South Dakota Local Transportation Assistance Program (SD LTAP), the Office of Remote Sensing (ORS), and Engineering Extension.



UITS

promotes economic development in South Dakota by connecting SDSU technical problem-solving expertise to industry, business, and government. Types of assistance include product design/modification and process design/modification. The UITS also provides training opportunities to regional businesses.

ENTRE

aids new and potential business owners through two training courses. ENTRE I helps entrepreneurs determine if their prospective businesses are feasible. ENTRE II guides new business owners as they develop business and operational plans.

SDSGC

is dedicated to encouraging aerospace-related research, manufacturing, and outreach. It provides undergraduate scholarships, graduate assistantships, a faculty summer research program at EROS Data Center, Aviation Career Education camp for high school students, and various other opportunities and resources.

SD LTAP

answers questions that local governments have about new technology and trains employees in road maintenance and repair. Training programs are offered across the state, and videotapes and printed materials are also available.

ORS

provides informational services to government agencies about natural resources management, agriculture planning, ecology, hydrology, geology, and engineering.

Engineering Extension

helps private and public sectors of the state through four programs: 1) occupational safety and health surveys of workplaces, 2) training workshops on safety skills, including certification in asbestos removal, 3) economic development assistance, and 4) technical help for small industries and government agencies.



Opposite page: Kent Rufer, program manager for UITS, and Mike Monnens, program engineer for UITS, consult with Lyle Steenson of Falcon Plastics.

This page, top: James Manning, Jon Puetz, and Michelle Wenk, safety and health consultants for Engineering Extension, demonstrate correct use of workplace equipment. Bottom: Puetz, Manning, and Wenk

Company developing Crothers bid criteria

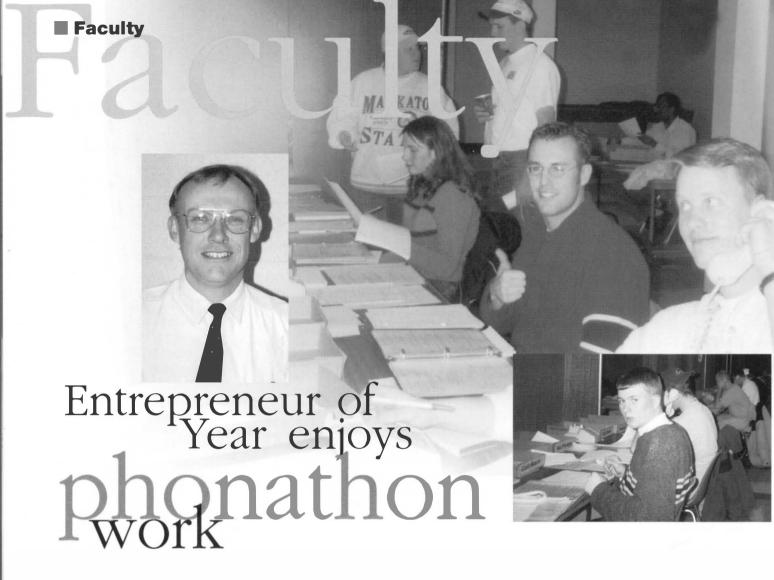
In the journey toward completion of the Crothers Engineering Hall addition and renovation, SDSU has taken another step.

The College has hired HDR Consulting Engineers of Omaha, Nebraska, to develop the criteria necessary for bid requests. HDR's president, Richard Bell, is a 1969 SDSU engineering graduate.

"We have met to determine where to gather the facts needed to develop the criteria, which will be published in a request for quotations from design/build firms," said Duane Sander, retired dean of the College of Engineering.

The project's timeline has been modified due to a recent shift in direction; while the original plans called for the addition to go to the west, a University land purchase presented an opportunity to build to the southeast instead.

The criteria should be completed by early fall, Sander said. The College will ask for bids at that time.



Hard work can be fun. Just ask Chuck Tiltrum, a driving force behind the success of the College of Engineering's annual phonathon.

"I enjoy it," Tiltrum said. "There's excitement working with active, involved students. It's both interesting and rewarding."

January's phonathon was the sixteenth, and Tiltrum has been involved since the first one in 1983, most recently serving as faculty chair of the Phonathon Committee. In large part because of his contribution to making the phonathon a success, Tiltrum was recently named Entrepreneur of the Year by the College.

Tiltrum's dedication to the phonathon is a perfect example of entrepreneurship, said recently retired Dean Duane Sander. "Professor Tiltrum has been involved with the phonathon since its inception and has continued to support and encourage our students to participate," Sander said. "They all remember him as one of the most

dedicated people present throughout each phonathon."

Trent Bruce, student co-chair of the phonathon, certainly admires Tiltrum's hard work. "It wouldn't be as smoothly run without Tiltrum," Bruce said. "Everybody involved feels that way. I don't think there would be an engineering phonathon without him."

Preparation for the phonathon begins early. "We start planning right after Hobo Day," Tiltrum said. "After Christmas vacation, there's a planning meeting every week."

Students are encouraged to volunteer their time on the sixty phones that are set up in the basement of Pierson Hall. Prior to the start of the phonathon, volunteers attend a training session to learn the proper way to make a fundraising call and to go over the administrative details for which they will be responsible.

The SDSU Foundation provides the College with alumni names, which the

students split up according to time zones and academic departments. There is a friendly competition among the departments to get the most pledges, Tiltrum said. Engineering support staff is present each night to process the pledges after the students are done taking down the information.

Again this year, the Phonathon raised over \$100,000 for a variety of projects within the College. Tiltrum said that some alumni specify what they want their pledge to go toward, such as a scholarship or computer equipment.

In addition to raising funds for the College and updating alumni information, students develop contacts for future jobs, Tiltrum said. "I wish I'd have kept a list of the students who got a summer job, or a permanent job, as a result of our phone contacts."

There are other benefits to working the phones. The students gain valuable phone communication experience. It's a great opportunity for underclassmen to get to know the upperclassmen within their College. "It will also be a great item on the students' resumes." Tiltrum said.

Good food is another reward for the participants. There's a new supper menu each night, ranging from pizza, to chicken, to hamburgers, and more. Dean Sander's wife also brings treats. "Mrs. Sander must have her own bakery," Tiltrum said. "She makes us so many brownies and bars, and brings them over every night."

There is also a small cash prize each shift. A \$40 SDSU sweatshirt goes to one of the volunteers. There are other individual awards in each department.

Beyond earning individual incentives and funds for the College, students are motivated to raise money for their department's student engineering organizations, like the SDSU student chapter of the American Society of Civil Engineers, which Tiltrum advises. Each department's chapter earns

five percent of the money it raises up to its goal. In addition, the ASCE student chapter earns half of the funds above their goal. "This is the incentive to get the students there the last couple nights." Tiltrum said.

Tiltrum earned his bachelor's and master's degrees from SDSU in 1972 and 1974, respectively, and worked for the City of Sioux Falls from 1974 to 1981 as a design engineer. He joined the Civil Engineering Department in 1981.

Burckhard conducts practical research

Suzette Burckhard, assistant professor of civil and environmental engineering, believes in the practical side of engineering. Whether it saves tax dollars or directly improves public safety and the environment, Burckhard wants her research to have tangible benefits.

"If I can't explain it to my grandmother, I shouldn't be doing it," she said. "If she understands it, then I've succeeded."

Continuing research she began as a doctoral student at Kansas State University, Burckhard is examining the use of vegetation to remediate contaminated soil sites, such as mine tailings. Vegetation prohibits contaminants from spreading, prevents erosion, and visually improves the area, she said.

In searching for more efficient ways to monitor how well the vegetation is working, Burckhard has found that satellite remote sensing saves money and time. Remote sensing is more effective than relying on field testers alone, she said, because it is less labor-intensive and provides better overall information on large sites. What would take field testers weeks, even years, takes only days using satellite-provided data.

For example, a satellite readout assigns a pixel size for an area of land. In the case of Landsat thematic mapper data, a pixel represents 0.2 acres. Using the Normalized Vegetation Difference Index, scientists can tell if the vegetation is not doing well in certain areas. At that point, field testers can be dispatched to that area to collect further data.

This satellite-based approach has proven more costeffective than field testing alone. Using remote sensing to test phytoremediation has realized an eighty percent reduction in costs at a specific site with contaminated soil.

Traditional field testing is extremely expensive, and cutting these costs allows scientists to spend more money cleaning up the sites in the first place, Burckhard said. However, the testing is vital.

"After you put the vegetation in, you can't just walk away," she said. "You have to make sure the public is safe."

Burckhard sees the big picture in working with contaminants because of her well-rounded education. She obtained her Ph.D. in civil and environmental engineering from KSU in 1997. She also holds master's degrees in physics and chemical engineering from KSU, earned in 1992 and 1993, respectively. Burckhard graduated from SDSU with an engineering physics degree in 1986.

Her education enables her to understand how all the concepts of contaminated soil, hydrology, remote sensing, and remediation work together. Her research has been published in several publications, mostly for informational purposes. Recently, she had an article, "Satellite sensing in assessment of phytoremediation field sites," published in the February/March 1999 issue of *Soil and Groundwater Cleanup*.

Her data helps the regulators in Washington, D.C., understand how to position their agencies in the years to come, Burckhard said.

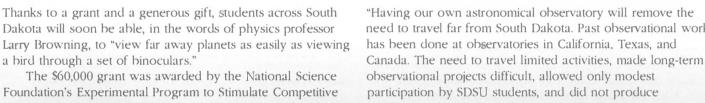
"It's exciting," she said. "I've written a few articles, and they're calling, wanting to know more. That's unusual."

Burckhard spends much time with practicing environmental professionals and members of the science community. Her work with remote sensing brings the two fields together by creating an interface where both get the information they need to produce tangible results.



Suzette Burckhard and graduate student Daniel Pirkl examine a sample in the laboratory.

SDSU to have first astronom research facility in the state



Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR) in South Dakota. The \$30,000 gift is from Marian Fillbrandt, a 1933 SDSU graduate and retired teacher. The money will allow the Physics Department to purchase two telescopes to be placed in a campus observatory.

When the observatory is complete, physics professor Steve Schiller said, "It will be possible to operate the telescopes remotely from a desktop computer over the Internet. This will make the telescopes accessible to students and faculty throughout the state, from universities to elementary schools."

Browning, who will direct this educational component of the program, is holding summer workshops to teach educators how to use the observatory and plan lessons around the telescope images.

Schiller will direct the telescope research, focusing on the study of binary stars in open clusters. "The observatory will be the first astronomical research facility in the state," he said.

need to travel far from South Dakota. Past observational work Canada. The need to travel limited activities, made long-term involvement by other South Dakota schools."

The facility, which will be named the Fillbrandt Observatory in honor of Marian and her late husband, 1935 SDSU graduate Arthur "Casey" Fillbrandt, will house a fourteen-inch Schmidt-Cassegrain wide field telescope for deep-space viewing and an eleven-inch Schmidt-Cassegrain for viewing the planets. Each one will be on a separate robotic mount connected to a filtered camera for recording pictures in different colors.

The telescopes are being tested this summer. Until the observatory building is completed, they will be operated on portable mounts by faculty and students. The observatory may be part of the Crothers Engineering Hall renovation and addition.

Top: Stephen Schiller (middle) and Larry Browning demonstrate a new telescope for student Tony Harrell. Bottom left: Schiller. Bottom right: Browning.

Vandever loves working with students

There are college professors who prefer teaching only advanced classes, filled with students who have already attained a reasonably high level of knowledge and skills in the subject area. Jan Vandever is not one of those teachers.

"My favorite class to teach is beginning algebra," she said.
"There I encounter many nontraditional, first-time college math students who need special care to overcome obstacles. It is a course of change, from fear to confidence."

Vandever is confident that all her students can be successful. "It sometimes takes patience, creativity, and teaching talent to find what will work with particular individuals," she said, "but the effort is often rewarded." One of Vandever's favorite rewards is receiving a letter from a student at the end of a semester, thanking her for her patience and caring and for making a difference.

When Vandever was a college student, she became friends with an elementary teacher who made a huge difference in her life. "This teacher had a profound impact on my becoming a teacher," Vandever said.

That experience demonstrated to her the importance of role models and mentors, a lesson Vandever has not forgotten. Teaching various levels of algebra, geometry, and calculus, including classes preparing students to teach math, enables Vandever to be a role model and a mentor to many. In addition to teaching, she finds time to advise the SDSU chapter of Alpha Lambda Delta (ALD).

ALD is the freshman honor society that recognizes academic achievement. First-year students with a grade point average of 3.5 or higher are eligible for membership, as long as they carry at least fourteen credits. "One of the most important things that a university can do is recognize student achievement," Vandever said. "Such recognition contributes to continued success."

Vandever's involvement with ALD dates back to 1983, when in recognition of her work with freshmen at SDSU,

she was

given an honorary membership. That same year, the chapter's adviser, Sylvia Troutman, retired, and the students asked Vandever to take over. She has served in that capacity ever since.

"It's just a blast to work with the students," Vandever said. "They're the best and the brightest, and they're not just math majors; they're majors from across the campus. So this is just great."

On October 24, 1998, in Denver, Vandever was installed as member-at-large of the National Council of ALD. The national council installs only one new member-at-large each year. She serves on award selection, chapter relations, expansion, and publications committees.

As part of the national leadership of ALD, Vandever has had the opportunity to attend a student leadership workshop, where she was impressed with the enthusiasm and creativity of the almost 200 students who participated. This spring, Vandever represented ALD at Iowa State University's chapter initiation, where she shared the speaker's podium with the president of the university, speaking to a crowd of over 500 students and parents.

Whenever she travels, Vandever enjoys returning home to SDSU. "The students at SDSU are hard-working and usually enthusiastic learners. Our students are well-mannered, refreshing, and friendly," she said. "The University has good programs, and students who are willing to put out the effort get a good education here."

In addition to her teaching and ALD responsibilities, Vandever also belongs to the Student Council of Teachers of Mathematics, coordinates mathematics placement, supervises teaching assistants for the math department, and serves as assessment coordinator for the math department.

Integrating technology into the mathematics curriculum is Vandever's chief area of research interest. "Graphing calculators and the Internet have had a profound impact on classroom instruction," she said. "We need to carefully study, develop and assess how best to use these capabilities. It's an exciting time, but also a scary time, to be an educator."

Vandever's entire professional life has been devoted to education. Prior to becoming a college professor, she taught math at elementary schools, middle schools, and junior and senior high schools. As a student, she said, she began enjoying math at least in part because girls weren't supposed to enjoy math.

Vandever received her bachelor's degree from Monmouth (New Jersey) College, her master's degrees from Rutgers (New Jersey) University and Colorado State University in Ft. Collins, and her doctorate from the University of North Dakota in Grand Forks.



Faculty

Faculty receive Research Development

Grants

Five College of Engineering faculty members have been awarded Research Development Grants to develop their research projects.

Dennis Helder, associate professor of electrical engineering and director of Engineering Research, said the College funds these grants with money returned through research overhead. "It's used as seed money," Helder said.

Faculty members must compete for the \$2,500 grants. In determining who receives these grants, Helder said, three areas are considered: contribution to identified areas of research in the College, development of new faculty, and other research which shows promise.

One of the grants is funded through the Merrill Stiles endowment. Stiles was a native of Cresbard and a 1929 graduate in electrical engineering. He served in World War II as a member of the Signal Corps, then became an engineer with the Department of Defense, where he remained until his retirement in 1971.

Duane Sander, who recently retired as dean of the College of Engineering, said the purpose of the endowment is to provide opportunities to faculty who are developing research interests, to help them identify and develop background information, and to support their research.

The following faculty members received the grants.



Francis Ting,

associate professor of civil and environmental engineering: "Measurements and Detection of Coherent Structures in Bridge-Pier Flows by Particle Image Velocimetry." The objective of this research is to measure the flow pattern adjacent to a bridge pier in an open channel flume using an optical imaging technique called Particle Image Velocimetry. Local scour at bridge piers provides the motivation for this project. Predicting scour depth and improving design techniques to provide scour protection on bridges are high priorities in transportation planning and research.



Madeleine Andrawis,

associate professor of electrical engineering: "Surface Soil Moisture Estimation from Spaceborne RADAR Measurements." Soil moisture plays an important part in the water and energy budgets necessary for climate studies, and accurate assessment of pre-planting soil moisture conditions is necessary for good agricultural management. This research studies data retrieved from active microwave instruments and examines Shi's Algorithm. This research may lead to NASA's use of such an algorithm to estimate soil moisture from measurements taken by the future Lightweight Synthetic Aperture Radar (LightSAR), to be launched by 2002.



Steve Hietpas,

associate professor of electrical engineering: "Three-Phase AC Voltage-to-Voltage Converter for Replacement of Tap-Changing Distribution Transformers." Power quality, the quality of voltage and current a facility has, is one of the main considerations of industrial and commercial applications today. Processes, especially in industrial plants, must operate uninterrupted where high productivity levels are an important factor. The primary objective of this research is to design, develop, and construct a working AC-to-AC converter prototype that solves problems related to line voltage regulation, such as voltage sags and harmonic distortion.





Michael Ropp,

assistant professor of electrical engineering:
"A Microprocessor-Controlled DC-DC Converter for
Photovoltaic Systems." Photovoltaic (PV) or "solar electric"
systems need a device called a maximum power point
tracker (MPPT) to enable them to operate at their highest
efficiency at all times. In systems without an MPPT, the PV
batteries and array must be drastically overdesigned, which
makes the system very expensive. Therefore, MPPTs are
critical to the economic viability of PV systems. With a
microprocessor-controlled converter, the best MPPT control
algorithm will be found through experimental comparison.



Fereidoon Delfanian,

associate professor of mechanical engineering: "Application of Computational Fluid Dynamics System (CFD2000) to Predict Air Flow and Pollutant Dispersion in an Enclosure." Predicting pollutant dispersion within an enclosure presents a complicated problem because of the nature of air flow and pollutant dispersion. In the search to find a computer code capable of addressing this issue, the Computational Fluid Dynamics System (CFD2000) has been selected as a means of furthering study in this area. This research will contribute to the body of information that provides professionals with cost-effective tools to predict and prevent air quality problems in buildings.

College receives grant for new equipment

The College of Engineering has received a \$142,000 grant from the National Science Foundation for a Particle Image Velocimetry (PIV) System. In addition, the University, the College of Engineering, the Department of Civil and Environmental Engineering, and the Northern Great Plains Water Resources Research Center provided \$60,000 in matching funds.

The equipment uses a pulsed laser sheet to illuminate tracer particles in air or water flow. Cameras take photos of the illuminated particles as they move through the fluid, allowing researchers to measure the velocity field.

Francis Ting, associate professor of civil and environmental engineering, and Vernon Schaefer, professor of civil and environmental engineering, co-wrote the grant. Ting said that the equipment will facilitate teaching and research practices because it will allow the College to perform new experiments. Studying flow characteristics helps engineers understand

erosion caused by water, such as scour around bridges and shoreline erosion.

Researchers and students can apply knowledge gained from these experiments to a wide range of engineering problems, Ting said. This

equipment will help illustrate many important concepts to students, he said, and provide the opportunity for more grants and further research in this area.

"Our long-term goal is to improve research infrastructure in the College of Engineering and improve the teaching to undergraduate and graduate students," Ting said. "The PIV is arguably one of the most useful pieces of lab equipment for velocity measurement."

Faculty Notes

Kurt D. Cogswell, assistant professor of mathematics and statistics, and Michael E. Ropp, assistant professor of electrical engineering, were among fifty-seven faculty members statewide to receive funding for computer-based projects this summer as part of Governor Janklow's Teaching with Technology program. Cogswell's project is entitled "Chaotic dynamical systems, an Internet-based course," and Ropp's is "Linear control systems."

M. Nadim Hassoun, retiring professor of civil and environmental engineering, is nearing the end of his term as a member of the 1989-99 Professional Engineers in Education Executive Board.

Harry Svec, assistant professor emeritus of general engineering, died in May. Svec taught general engineering at State for thirty-eight years, focusing on welding and metal hardening responsibilities involved in shops production. A certified high pressure pipe and structural steel welder, he became known as "Mr. Welder" to students and colleagues. Svec learned welding at age fifteen and practiced that trade throughout his career, working at Huron Welding Shop, teaching for the National Defense Training Program, and coowning Commercial Weldery in Bruce before joining the SDSU faculty. During the summers, he welded steam pipes for the SDSU physical plant and the city power plant. After his 1982 retirement, he continued inventing, designing, and creating in his basement workshop. He is survived by his wife, Lillian; his daughter, Marilyn Goos; his sons, Roger and Harvey, both general engineering instructors at SDSU; seven grandchildren; and many other extended family members.



Francis Ting and Steve Anderson, faculty members in civil and environmental engineering, demonstrate SDSU's new PIV System.

Expo challenges, inspires students

High school and college students rubbed elbows with professional engineers, competed with one another, and learned more about careers in science at Engineering Expo in April.

Students

Expo featured high school and college contests, industry booths, and the ever-popular "Wonders of Science" show, in which Larry Browning, associate professor of physics, demonstrated scientific theories with the showmanship of a magician.

More than 350 high school students from South Dakota and surrounding states attended Expo, competing for gift certificates from the SDSU bookstore as they created items such as balsa wood bridges. Other contests included "The Scrambler," in which a team constructs a

vehicle to transport a chicken egg six meters, and "Write It, Do It," in which half of a team writes a description of an object and how to build it, and the other half of the team uses the written information to recreate the object described using Legos. A physics bowl was also a part of the high school activities.

College students had the opportunity to put their abilities to the test, as well. Contestants could participate in the Bridge Building Contest, the Tower of Power, and the American Society of Mechanical Engineers (ASME) Rock Retriever Project. Students could also take part in a College Bowl competition.

Co-chairs Corey Halstead of Sioux Falls and Dale Godbout of Brownsville, Minnesota, learned a great deal from their hours of preparation for the event. "I learned to effectively use people skills in my committees," Halstead said, "knowing what they could do and how to best utilize what they could do."

Getting ready for Expo involved even more work than either Godbout or Halstead expected. "Getting information to the high schools was the hardest part," Godbout said. "It took a couple of weeks to get all that mailing done."

"The week before the Expo was more difficult than I thought it would be," Halstead said. "But I had great people helping out along the way, so overall it wasn't that difficult at all."

Halstead is especially grateful to the Expo committee members, to the members of Sigma Phi Delta, who did much of the set up and tear down for Expo, and to Barb and LaVonne, the secretaries for the College of Engineering, who "always steered us in the right direction," he said.

Both
Halstead and
Godbout said
that high school
students are the
main focus of
the Expo. "We
wanted to make
it an event for
the high school
students,"
Halstead said.

"We made a couple of the events quite difficult this year because we wanted to really challenge them," he said.

"The goal was to get the high school students involved and to inform them about the different kinds of engineering that are out there and how engineers go about doing their jobs," Godbout added. "Before I started college, I really didn't know what an engineer was or did. The



lop: Dale Godbout and Corey Halstead served as Expo co-chairs. Above: SDSU's concrete canoe was on display during Expo. Left: College and high school students examine the 1999 minibaja vehicle.

high school students who come to the Expo are learning about, and exploring, different engineering majors, and they're getting a chance to see SDSU."

Participation in Expo also gives students a sense of accomplishment, Halstead said. "They can see what some of the qualities are that are needed by engineers, such as the perseverance to follow through with their projects, overcoming difficulties to achieve success," he said.

Those are the very qualities it takes to organize a successful Expo, and Halstead and Godbout plan to use those qualities to plan another Expo next spring.

"It's just a lot of fun," Halstead said. "Sometimes it's work, but more often than not, it's fun. It's also great for the College, not just for our students, giving us a chance to demonstrate what we've learned, but also for the high school students. It promotes the College to them, and some will end up attending SDSU because of the Expo.

It's well worth the time and effort we put into it."

College Contest Winners

College Bowl: Steve Lehn of Loretto, Minnesota, Paul and Mark Fredin of Mountain Lake, Minnesota, and Karl Palmberg of Valley Springs, first; Heath Boe of Revillo, Amy Fystro of Irene, Johnathan Hagena of Lennox, and Chris Bessler of Elkton, second: Lynn Bruns of North Mankato, Minnesota, Neil Groon of Arlington, Laura Mehlhaf of Menno, and Angie McIntosh of Elk Point, tied for third; Kent and Brad Miller of New Effington, Adam Sorenson of Lake Preston. and Brian Fritz of Madison, tied for third

Bridge Building

Competition: Brad Miller of New Effington, first; Brad Ruppert of Tyler, Minnesota, second; Kent Miller of New Effington, third.

ASME Rock Retriever
Competition: Richard
Schuerman of Sioux Falls, Justin
Knecht of Houghton, Ryan
O'Connor of Huron, and Mark
Endahl of Canby, Minnesota,
first; Terry Rennich of White,
Dan Molseed and Heath
Hoftiezer of Pierre, and Ben
Bofenkamp of Sioux Falls,
second; Jim Steinmeyer of
Aurora and Jason Osbahr of
Brookings, third.

Visitor Team promotes engineering

As a team comprised completely of college students, the College of Engineering's High School Visitor Team knows how to show high school students a good time: get them out of class.

Actually, it's much more than just getting the students out of class, said Matt Asche, a senior electrical engineering and physics major from Hancock, Minnesota. Asche and Mat Klein are co-coordinators of the Visitor Team and believe the demonstrations the team presents are very educational, for both the high school students and college students.

"They have a lot of fun learning how science works, and we have a lot of fun teaching them," Asche said. "When we can apply what they learn in the classroom to everyday life, they begin to take science a lot more seriously."

In 1994, students in the College of Engineering joined together to travel to high schools in the region. The High School Visitor Team has visited elementary and middle schools, as well, but it mainly focuses on grabbing the attention of high school students.

Team members encourage students to enroll in math and science classes during high school and to consider the many fields of science, engineering, and technology when choosing a career. Students learn about opportunities available to engineers, as well as about SDSU's own College of Engineering.

Afterwards, team members present exciting demonstrations that illustrate how science is used in day-to-day life. Larry Browning, associate professor of physics, shows team members how to present some of his favorites.

For one demonstration, team members insert screws in the sides of a giant pickle, plug it into an electrical socket, and watch it light up. In another, big tubes are placed over burners to create loud vibrations similar to the sounds an organ pipe emits.

"If you know what you're doing, you can get some pretty amazing results with these demonstrations," Browning said. "And what is even more amazing is that all of this makes sense. There's a way to explain it all."

Mat Klein, co-coordinator of the Visitor Team, especially enjoys learning how to put on different demonstrations.

"We learn from this too, because we have to know how to safely present an experiment that is really going to excite the students," said Klein, a senior electrical engineering and engineering physics major from Rosholt. "When we see the students' faces light up at the results of an experiment, we know that it's all been worth the effort."

The team is comprised of eighteen members who take turns going on trips to schools within the region. Some trips take only a few hours, but others can last the entire day, depending on how far the team drives and how many demonstrations are done at each school.

In the past, the team has visited high schools in Vermillion, Sioux Falls, Brookings, Alexandria, Baltic, and Tracy, Minnesota. They have also gone to Brookings elementary and middle schools.

Duane Sander, retired dean of the College of Engineering, said participating in the High School Visitor Team provides SDSU students with an opportunity to learn many valuable skills.

"Members of the Visitor Team must demonstrate an interest in informing students who are making career decisions with information on the many careers within the disciplines of engineering," Sander said. "They must be able to explain technical concepts in a way that makes sense to people who don't have the same background. That is an important characteristic of effective communication, and a necessity in the field of engineering."

Student AGC Chapter Theads to Vegas

Whoever said that you have to be out of college to achieve fun, fortune, and fame was wrong. That's exactly what forty-two students in SDSU's Chapter of the Associated General Contractors of America (AGC) did when they embarked upon a twenty-seven-hour bus trip to Las Vegas, Nevada, for the ConExpo/ConAGG Exhibit this March.

ConExpo's theme was "Leadership for the Next Century—Constructors Committed to Excellence." With 1.8 million square feet of display, ConExpo is the largest construction exhibit in the United States and typically draws over

100,000 people.

Students were able to tour some parts of Vegas. gamble in the casinos, and meet a number of contractors that could serve as valuable contacts after graduation. Overall, the trip was

very worthwhile, said Spencer Degen, a senior construction management major from Parkston.

"I cannot pick just one highlight of the trip—it was all just so much fun," Degen said. "There was so much to see and so much to do. I hardly slept at all because I wanted to take it all in."

Of the students, thirty-nine were construction management engineering majors, two were landscape design students, and one was a civil engineering major. Five faculty members accompanied the students, and three SDSU alumni of the construction

management program joined the group in Vegas.

During the convention, the South Dakota AGC Building Chapter's Board of Directors treated SDSU's group to lunch. Board members asked students how they enjoyed the Expo, as well as the construction management program at State. Students received free passes to over 100 different seminars and met many professional contractors.

Peter K.W. Wert, past president of the Associated General Contractors of America, said in the August 1998 newsletter for AGC that ConExpo serves as a wonderful source for job contacts.

"One of the greatest benefits of an AGC Convention is networking and the knowledge gained from others facing the same challenges in the construction marketplace," he said.

Degen, who hopes to work as a project manager for a large company, is treasurer of SDSU's AGC Chapter. He's counting on the contacts he made at ConExpo to help him find a job after graduation in December.

This page, top: SDSU students and faculty members take a hard-hat tour of the Hoover Dam. Far left: Faculty members and alumni—from left, Wayne Haug, Karla Haug, Mike Foster, John Reposa, Craig Kreyger, and Chris Stoeckman—relax in the lobby of the Excalibur Hotel. Near left: SDSU construction management students try to decide which ConExpo exhibit to visit next. Opposite page, top: Students board their bus in front of Crothers Engineering Hall. Bottom: After twenty-seven hours, they arrive in Vegas.

"Since the Expo is so huge, we met contractors left and right," Degen said. "It's great to know that there's someone out there who is willing to help us get started after graduation."

Students stayed at the Excalibur Hotel and visited a number of different casinos. They examined the different methods of construction used on all the buildings, and those who were over twenty-one gambled a bit.

One day, the group visited Hoover Dam, located about fifteen miles from Las Vegas. They received a special two-hour "hard-hat tour," in which students and faculty followed a guide through the cooling and inspection tunnels. The guide revealed various methods that staff used to mark and monitor cracks in the dam, and also answered any questions concerning the construction of the dam.

"It was an amazing tour, and the highlight of the trip for many of the students," said Craig Kreyger, an assistant professor in the construction management program, who is pleased with how well the trip went. From the moment they stepped onto the bus until their return back home, Kreyger said, the students behaved professionally.

"It went really well, and I'm very proud of them for behaving so great," he said. "They were very considerate of one another, and those who were under twenty-one didn't even think about trying to gamble when we visited the casinos."

While the primary purpose of the trip was to introduce the students to the various products at ConExpo, another motive was to get them excited about competing in the regional construction management student tournament. In this competition, students receive plans and specifications on a real construction project, then have twenty-four hours to bid and estimate the job and present their proposals. Before entry forms are submitted, students must be aware of

what they are getting into, said John Reposa, Jr., coordinator of SDSU's construction management program.

Kreyger agrees. As advisor of SDSU's AGC Chapter, he believes that by observing the competition as a team and taking the time to plan their projects, students should do very well at the regionals.

"We want to make sure we know what to expect at the competition, and also that we will be able to represent SDSU well," Kreyger said. "That takes a lot of time, and a lot of preparation."

"After five successful years of the construction management program, I think our students are ready to get a team together for observation and planning," Reposa said. "By the 2000-2001 academic year, the team should be ready to compete."

But amidst all that observation, the students had a lot of fun, too.

Although Jeff Serocki, a senior construction management major from Sisseton, had already been to Vegas, he found the trip informative and exciting. From the latest equipment to the newest software, ConExpo offered everything imaginable, he said.

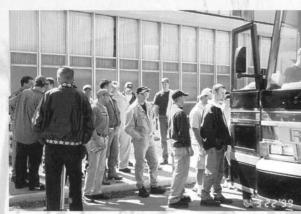
"The Expo was just unreal,"
Serocki said. "We saw so much
equipment and construction that we
wouldn't normally get to see in
South Dakota. It was a once-in-alifetime experience."

Registration for the trip was about

\$300 per person.
Students turned to their employers for partial sponsorship and received nearly \$3,000 from the two South Dakota Chapters of AGC. In the end, students also contributed a bit themselves, but not enough for Serocki to complain about.

"This is an opportunity no one should pass up," he said. "Paying so little to see something so amazing—you can't argue with that."

Any student interested in a career in construction is invited to join the AGC Chapter at State. In the past, AGC students have helped the Sioux Falls Chapter move into a new building and also spent a day examining construction sites with the AGC of South Dakota Highway Heavy Utility Chapter. Next year, the group hopes to recruit more members, coordinate a picnic to welcome new members early in the fall semester, and sponsor a number of fundraising events.







SDSU CONCrete Concrete tops region

The words "concrete" and "canoe" are not generally associated. But civil engineering students can take concrete and turn it into a canoe that glides so smoothly, student Travis Konda said, "It's just like pushing a dart through the water."

The SDSU team took its concrete canoe to the regional competition in April at Platteville, Wisconsin, and came home with their second consecutive regional championship. Finishing first in seven of nine categories, they defeated teams from University of North Dakota, University of Iowa, Iowa State University, University of Minnesota, and University of Wisconsin at Platteville. The win earned them a trip to the national contest June 17 through 19 in Melbourne, Florida, where they placed thirteenth of twenty-four teams from other universities nationwide.

"I don't think most people realize what a big deal this is," Konda said. "We're going up against schools with classes that work on the concrete canoe. We do it on our own time. For a couple of thousand bucks, we build a canoe that competes against schools with large budgets, schools that get large donations of supplies and funds."

Team members and faculty advisor Chuck Tiltrum believe that hard work and dedication make up for what they lack in money and school size.

Tiltrum credits the South Dakota work ethic, and Konda agrees. "They've been out paddling on the Sioux River when there was ice in the water," Konda said. "The students here really work their tails off."

When Konda and team member Teresa Kub of Ipswich first slid this year's canoe onto the water at the Bowes Construction gravel pit, the air temperature was in the thirties. When the canoe capsized, they discovered that the water was just as cold. Once back in the righted canoe, they capsized again, a frightening experience. Exhausted,

wet, and freezing, they eventually made it safely back to land.

The experience shows the level of dedication of the team members. It also taught them that in this year's canoe, they would need to lower their center of gravity by sitting rather than kneeling, as they had in previous years.

That's something that teams from most other schools never would have discovered, since they don't take their concrete canoes into the water prior to competition, afraid of pre-race damage. But the SDSU team is confident of the durability of their work, which involved thirty-six civil engineering students putting in more than 1,500 hours outside the classroom.

Travis Konda and his brother Daren, both of New Effington, co-chair the team, which captured first-place regional honors in oral presentation, display, paper presentation, outstanding canoe, men's sprint, men's distance, and women's sprint. They also placed third in women's distance and fifth in coed sprint.

The victorious men's sprint and men's distance teams are comprised of Travis Konda and Brian Fitzpatrick of Foley, Minnesota. Teresa Kub and Laura Baumberger of Colton make up the winning women's sprint team.

The other paddlers are Daren Konda, Jennifer Briggs of Maple Lake, Minnesota, and Simone Tschida of Inver Grove Heights, Minnesota.

This year's canoe is nineteen feet long and weighs about 115 pounds. To make it possible to float, competition canoes are made of a special light concrete that does not use the sand and gravel aggregate found in the usual construction concrete.

But unlike other teams, the SDSU students made their canoe from 100 percent concrete, even though they are only required to use seventy percent Portland Cement as the bonding material. "We're proud of the fact that our canoe is all concrete," Travis Konda said. "A lot of schools use a latex or other material to make the concrete more flexible, but ours is concrete."

The design of the canoe must be a compromise between stability and speed. "If you want your canoe to be really

stable," Konda said, "then you make it really wide. But if you want your canoe to be fast, you're going to have to sacrifice some stability and keep it long and narrow."

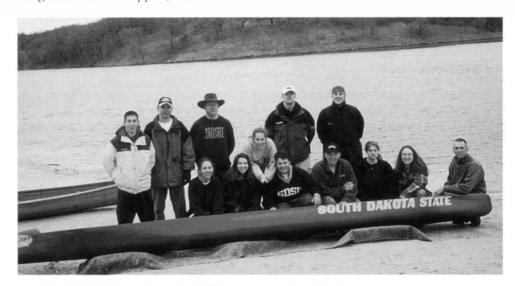
But to win against stiff competition, you need more than a well designed canoe; you need a good team of paddlers. According to Tiltrum, "You could put a good team in a bad boat and completely outshine a bad team in a good boat. Fortunately, we have a good canoe and a good team."

Tiltrum and all the team members are grateful for the support, financial and

otherwise, they have received from the College of Engineering.

Opposite page: Travis Konda and Brian Fitzpatrick, members of the men's distance concrete canoe team, race to the finish at the regional competition in Plattesville, Wisconsin.

This page: SDSU's 1999 regional championship concrete canoe team members are Daren Konda, Jim Kollar, Laura Baumberger, Brian Fitzpatrick, Tricia Berger, Jennifer Briggs, Crystal Dulas, Jason Davis, Paul French, Jason Boomer, Teresa Kub, Simone Tschida, and Travis Konda.



ASME students win regional competition

Engineering students from SDSU swept the design competition at the American Society of Mechanical Engineers (ASME) Region VII Student Conference.

This is the second year in a row that SDSU students have won this competition and, this time, they brought home the second place honor, as well.

Juniors James Steinmeyer of Spearfish and Jason Osbahr of Dakota Dunes took the first place trophy for their project. Juniors Chris Bessler of Elkton and Barry Koepsell of Pierre placed second.

For this contest, students design a machine to perform a specific task. The projects are judged on their performance. The chosen machine was

a rock picker, which the students created as part of the Introduction to Mechanical Design class, taught by Don Froehlich, professor and head of the Mechanical Engineering Department.

Twenty-one engineering schools from seven states were represented at the conference. SDSU students competed against students from much larger universities, such as the University of Minnesota, Iowa State University and Kansas State University.

"When we see that we can compete with the bigger universities, and our students are performing as well, and sometimes better, than their peers, this shows our students are getting a quality education at SDSU," said Fereidoon Delfanian, associate professor of mechanical engineering and ASME advisor. "It gives the students a good feeling, too."

Steinmeyer and Osbahr will compete against students from fifty countries at the ASME International Conference in Nashville, Tennessee, this November.

Tom Koehl, a senior from Morris, Minnesota, and Randy Hoogendoorn, a senior from Dell Rapids, received certificates for participation in the oral competition. Jessica Berens, a junior from Milbank, and Dan Gray, a senior from Elk Point, received certificates for participation in the poster competition.

Students

promotes friendship, fun



There are many different organizations on campus that engineering students can join, but only one group links the entire College together: the Joint Engineering Council (JEC).

JEC's mission is to promote activities in which all engineering students participate. The organization provides an outlet for students within each of the engineering disciplines to come together for various activities throughout the year.

JEC-sponsored events include the Engineering Job Fair held each fall and the College of Engineering Volleyball Tournament held each spring.

Open to students of all engineering disciplines, JEC chooses the chairpersons for the Phonathon and Engineering Expo. During the spring 1999 semester, the organization sponsored its first "Meet the Dean" session, which will now be held each semester so that students can become more acquainted with the dean of the College and stay updated on all campus events involving engineering students. At these sessions, students are encouraged to provide the dean and members of JEC with input on how to improve the College of Engineering and the various student activities.

By becoming a member of JEC, students are eligible to join the South Dakota Engineering Society and National Society of Professional Engineers. Such opportunities make membership within IEC hard to resist, said Duane Sander, who recently retired as dean and advisor of JEC.

"By participating in the Joint Engineering Council, students receive many opportunities to make new friends, establish connections nationwide, and have a lot of fun," Sander said, "Essentially, that's what the Council is all about."

Mat Klein, a senior electrical engineering and engineering physics major from Rosholt, was voted "Outstanding Member of JEC" for the 1998-99 school year. Currently, Klein is president of the JEC and a co-coordinator for the High School Visitors Team. He is recording secretary for the Institute of Electrical and Electronics Engineers (IEEE), president of Golden Key National Honor Society, and a member of the Society of Physics Students (SPS), Eta Kappa Nu, and Sigma Pi Sigma. Klein works as an SDSU Ambassador and physics laboratory teaching assistant and recently acquired his private pilot license.

Aside from organizing and attending all the meetings, Klein's main responsibilities as president of IEC include overseeing the job fair and volleyball tournament. This year, Tricia Berger and Angie Meyer did most of the work for the volleyball tournament, and Klein is grateful to them and the other members of JEC for always pitching in.

"We all understand that everyone has other responsibilities, too, such as homework and extra-curricular activities," Klein said. "Nobody is ever left to do all the work themselves."

Students who actively participate in an extra-curricular activity or organization while going to school must possess certain characteristics. Sander said.

"Students must be willing to take on extra responsibilities and learn to manage their time wisely," he said. "And they must also want to have fun. If the determination is there, students can do anything they set their mind to."

Klein believes it is important for students to be involved with extra-curricular activities or organizations while they are in college.

"I've learned a lot of time-management and leadership skills," Klein said. "Getting out of the classroom and actively participating in something besides studying really helps students grow as individuals."

In addition to the many personal benefits students receive from being involved with an organization, Klein said, participating in an extra-curricular activity also gives students the edge when graduation rolls around.

"Many employers are more interested in what activities students were involved in, rather than what their grade point average was," he said. "There is an increasing demand for students with good communication skills, which can only be acquired through hands-on involvement."

Baumberger proves herself 'Dynamic'

What's a great way to meet new people, make good contacts, and have a great time? Join an extra-curricular activity. Or join six, like Laura Baumberger did.

Baumberger, a sophomore civil engineering and Spanish major, was presented with the Dynamic Doer Award at the Distinguished Engineers Banquet in February. Given this year in the name of Dwayne Rollag, head of the Civil and Environmental Engineering Department, the award honors students who maintain a high grade point average while involved with a variety of campus organizations.

A native of Colton, Baumberger is a member of the Concrete Canoe Team. the High School Visitor Team, the student chapter of the American Society for Civil Engineers (ASCE), and the Society for Women Engineers (SWE). In ASCE, she is the 1999 Community Service Coordinator. In SWE, Baumberger is on the Membership

how to manage your time more wisely," she said. "And besides, GPA is not everything. You can't learn great communication and leadership skills by just staying in the classroom or library. Development Committee Employers really look favorably upon and the students who are involved in college." Newsletter Charles Tiltrum, associate professor of civil and environmental engineering and and the advisor of ASCE, describes Baumberger as "a real go-getter." "I think it's wonderful that Laura is so intent on staving involved. because we really need younger students to take on more leadership roles," Tiltrum said. "The Dynamic Doer Award is very indicative of Laura's abilities and enthusiastic attitude. She does a lot for us, and I'm



Homepage Committee. She especially enjoys participating in SWE. "I strongly believe in equal

opportunity between men and women," she said. "I think it's important to promote women engineers, since we are such a minority in the field."

Baumberger has also volunteered to help with training sessions for the Engineering Phonathon and the ASCE display for Engineering Expo. She played intramural basketball, works in the Personnel Department at Daktronics, and has a cumulative grade point average of 3.9.

Maintaining good grades and staving active on campus isn't as hard as everyone thinks, Baumberger said. "Being involved really helps you learn

> glad she is being recognized for it."

organizations. Baumberger has met many alumni and professionals who could serve as great contacts after graduation. It's never too early to start thinking about the future, she said.

"When graduation rolls around and employers are looking to hire a fresh face, they're going to remember the students who were really involved,"

In high school, Baumberger was just as active. A participant in nearly all sports, she was also a member of the student body government and a Natural (Peer) Helper. After graduation, she attended Truman State University in Missouri for one year, majoring in biology and Spanish. But she couldn't get her mind off civil engineering, so she decided to make a few changes.

"I knew that if I was going to major in civil engineering, I had better come back to South Dakota," she said. "SDSU has a really great engineering program, and it's a lot closer to home."

Right after she returned home, Baumberger's parents moved to Arkansas. Although she doesn't get to see them as much now, one good thing has come out of the move: Baumberger now has more time to devote to extracurricular activities.

"I want to remain active and keep meeting new people," she said. "Sure, I've got to think about my studies, but I've also got to have a little fun."

ASCE

chapter wins top award

It's official: the student chapter of the American Society of Civil Engineers (ASCE) is the best.

The group has received the Ridgway Award, distinguishing it as the top ASCE student chapter for 1998. SDSU will accept the award at the ASCE national convention in Charlotte, North Carolina, this October.

Chapter advisor Chuck Tiltrum, associate professor of civil and environmental engineering, commended the students for winning.

"They're really a tremendous bunch of people," he said.

This is the second time in three years that a South Dakota engineering school has earned the Ridgway Award; the South Dakota School of Mines & Technology won it in 1996. With 250 engineering schools in the nation, it is remarkable that South Dakota schools have brought this award home twice in such a short time span, Tiltrum said.

"I really think that's a tribute to the work ethic of South Dakota students," he said.

In order for chapters to be considered for the award, they must submit an annual report to National ASCE headquarters. Each chapter is evaluated on a number of criteria, including membership percentages, number of meetings throughout the

year, attendance, and community service projects. The numbers and percentages are numerically graded and awarded points, but objectives and community service activities really put a chapter on top, Tiltrum said.

The chapter initiated new community service activities last year under the direction of Tanya (Eichelberger) Miller of Willmar, Minnesota, who volunteered for the new position of community service coordinator. The chapter primarily focused on youth education, Miller said. The ASCE students worked with Girl Scouts, Boy Scouts, and Medary Elementary second graders.

"We try to educate them about how math and science relate to engineering," Miller said. The chapter took marshmallows and straws to build bridges, as well as surveying equipment, rocks, and concrete to give the students a hands-on learning experience.

Chapter members also helped build a Habitat for Humanity house, collected canned goods for the food bank and assembled school kits for the Red Cross.

Miller credits Rich Reid, assistant professor of civil and environmental engineering, with inspiring several chapter projects. "He had a lot of ideas," Miller said. "He's our connection to the community."

With so many activities and so little time, ASCE students must make an effort to get involved. Custer native and chapter president Trent Bruce said ASCE gets students involved early in their college years. He said members are involved because "they want to be

there, not because they have to be there" and can choose which activities they wish to work on, such as the High School Visitor Team or the steel bridge or concrete canoe committees.

Early student involvement builds continuity within the chapter. "We've been building on good things done in the past," said past president Daren Konda of New Effington.

Tiltrum credits the chapter's high standards to former ASCE president Alisa Prunty, who was killed in a car accident six days after her 1996 graduation. "She got the ball rolling," Tiltrum said, and, even now, the chapter is motivated by her memory.

Support from the Civil and Environmental Engineering Department and the College of Engineering itself has also contributed greatly to the chapter's success. "This award is a real tribute to Dr. Dwayne Rollag [department head] and Dean Duane Sander for their dedication to the real-world applications of our profession," Tiltrum said.

This support has allowed Tiltrum to serve as the chapter's advisor for seventeen years without that choice hurting his tenure or promotion, as it would in many other schools with the "publish or perish" motto. "It's the best part of my job," he said.

A combined effort from engineering students, faculty and staff has made this ASCE chapter the best in the nation, Rollag said.

"We regard the student chapter as an important part of their education," he said. "This is simply an incredible accomplishment."

Civil engineering students receive national. scholarships

Time and again, the College of Engineering has proven to offer some of the top programs in the nation. Nothing points that out more clearly than when SDSU engineering students win national scholarships.

Civil engineering majors Trent Bruce of Custer and Seth Greenwood of Lynd, Minnesota, were among twenty-five students selected from 250 engineering schools around the nation to receive scholarships from the American Society of Civil Engineers (ASCE). Bruce won the B. Charles Tiney Memorial Scholarship, and Greenwood earned the Samuel Fletcher Tapman Scholarship. Each award is worth \$2,000.

Scholarship applicants are judged on grade point average, leadership, and overall activities, especially in the ASCE. Based on those criteria, both Bruce and Greenwood are very deserving recipients, said Chuck Tiltrum, associate professor of civil and environmental

engineering and ASCE student chapter advisor.

Perhaps Tiltrum was not surprised at their awards, but Bruce and Greenwood expressed surprise—and relief—that they were chosen.

"It's overwhelming. I guess it shows the hard work and time I've put into my education." Greenwood said.

"I'm excited. It relieved a lot of pressure for next year," Bruce said. "These awards have a lot to say to about the program at SDSU."

Tiltrum has been involved with ASCE at the national level for seven years. During that time, he has observed that the students winning the national scholarships "were no better than SDSU students."

His being involved nationally encourages SDSU students to apply for the scholarships, Tiltrum said, but it does not give them any other advantages. He is excluded from reviewing scholarship applications from SDSU's zone.



Trent Bruce



Seth Greenwood

Hengeveld accepts IAC award in D.C.

Derek Hengeveld, a graduate research assistant, accepted the Outstanding Industrial Assessments Center (IAC) Student Award at the third annual Industrial Energy Efficiency Symposium and Exposition held in Washington, D.C., in February.

A Valley Springs native, Hengeveld earned his bachelor's and master's degrees in mechanical engineering from SDSU in spring 1997 and fall 1998, respectively. Now, he teaches at SDSU and works for IAC.

At the symposium, Hengeveld attended several energy efficiency seminars and presentations.

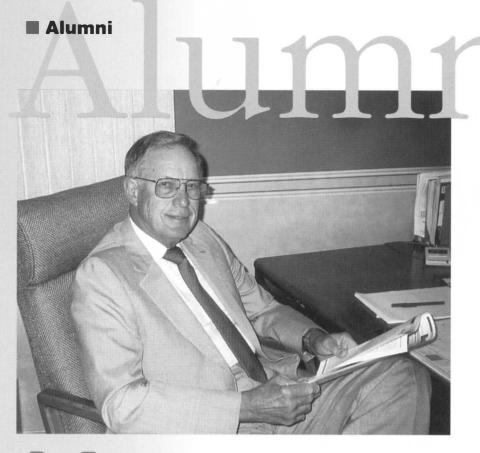
Particularly important to him was "the opportunity to talk to people from all over the country about what's happening in the energy efficiency field."

An interest in science led Hengeveld to SDSU, where he saw "good opportunities" in the engineering program. After a year of taking general engineering classes, he decided to pursue a degree in mechanical engineering, believing the field would offer a variety of job opportunities. He began working for IAC as an undergraduate.

"I'm really glad that I went into the industrial assessment program," he said.

Across the United States, thirty Industrial Assessments Centers are sponsored by the United States Department of Energy to help companies become more energy efficient. After spending from one to three days at a company, the IAC staff makes recommendations designed to increase energy efficiency, including a cost analysis. Derek Hengeveld





Mann: problem solver

From Abu Dhabi to Boston, Massachusetts, Jim Mann has solved problems all around the globe.

Mann, a 1949 civil engineering graduate, is retired now, but he spent much of the past decade developing consensus in some difficult construction disputes. In 1989, after a forty-year career as a construction engineer, he considered retirement, but decided he was not quite ready. Instead, he started his own construction consulting company and became involved in dispute review boards and arbitration cases. He also served as an expert witness for construction companies.

His participation on these boards sprang from his involvement with the Association of General Contractors and the Beavers, groups for the heavy engineering/heavy construction industry. Through his association with these groups and his presidency of the

Beavers in 1982, he became acquainted with many contractors, who later asked him to sit on their boards.

The purpose of dispute review boards is to resolve problems during the course of a project, rather than waiting until after completion and leaving the resolution up to lawyers and the courts, Mann said. He was a member of three boards, one in Boston and two in Dallas.

The Boston project involved a wastewater treatment tunnel that was being built to pump waste to an island for treatment before it was dispersed out into the ocean. "It started out as an \$80 million project and ended up as a \$150 million project," Mann said.

Mann's time on the Boston board spanned seven years, from early 1992 through 1998. "There were a lot of problems with this one, as we heard about forty claims," he said. Tunnels with more water infiltration than

expected, a tunnel fire, and cave-ins were some of the more memorable difficulties encountered.

The Dallas projects went more smoothly, and Mann visited the sites every three or four months to keep up with the progress. Both jobs involved the Dallas Area Rapid Transit System (DART). Mann sat on those boards for six years.

In addition to sitting on dispute review boards, Mann was a member of the American Arbitration Association, serving as an arbitrator in construction claims in Minnesota and Wisconsin.

Some of the challenges in settling construction claims, Mann said, are interpretation of the plans and specifications, complex scheduling issues, impact costs, and efficiency factors. Another occasional problem was getting all three members of the team to agree on one solution. Meeting and overcoming those challenges, however, was a satisfying part of the work.

A native of Raymond, Mann originally chose engineering because he liked math and did not want to farm. He decided to forgo a basketball scholarship at Huron University to attend SDSU.

Mann began his career inauspiciously enough, working as a construction and office management engineer for the Army Corps of Engineers at Ft. Randall Dam in Pickstown and Gavin's Point Dam in Yankton. That job set the tone for his long career in the construction industry.

He left the Corps in 1953 to join the Western Contracting Corporation in Sioux City, Iowa, as an engineer and estimator. After four years, he took a position as a project engineer and estimator with S. J. Groves & Sons in the regional office in Ann Arbor, Michigan, and later was elevated to chief engineer.

In 1969 he moved to the Groves Corporate Office in Minneapolis as vice president of engineering, estimating, and joint ventures. At the time, the company was one of the largest interstate highway builders in the nation, with ten different regional offices. In 1982, Mann became vice president of operations, which made him responsible for all area operations and joint ventures. This position took him overseas to locales such as Saudi Arabia, where the company built "roads, industrial sites, golf courses, and a city—whatever they wanted," Mann said. He traveled constantly for seven years to places such as Puerto Rico, South and Central America, Canada, Mexico, and the Far East. He also served on the management team for many large joint venture projects.

Mann briefly retired in 1985, but went to work for Green Construction in Dallas, Texas, in 1986. He was the president of Green's holding company for three years before moving back to Minneapolis.

After several years as a consultant and arbitrator, Mann is retired again—for the final time. He hopes to spend more time with his family and play more golf.

Mann still keeps in touch occasionally with classmates Jim Dornbush and Wayne Knabach, both retired faculty from the College of Engineering. He has also kept his ties to SDSU by working with former deans Ernest Buckley and Duane Sander.

He worked closely with Buckley in recommending the construction management major in 1984 and served on the Dean's Advisory Council from 1985 to 1997. Mann was named a Distinguished Engineer in 1986. He has enjoyed his involvement with SDSU and feels that "SDSU students needn't take a back seat to anyone."

Mann and his wife, Marvel, divide their time between Plymouth, Minnesota, and Sun Lakes, Arizona. They have four children and six grandchildren.

Dean's Club

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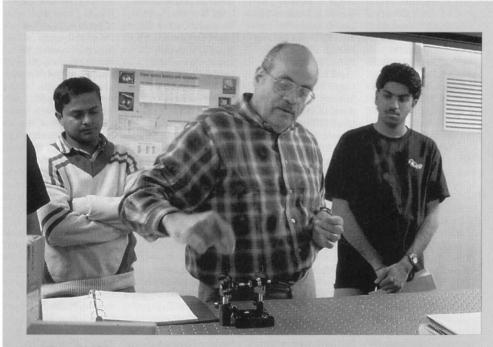
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Let There Be Light: Alfred Andrawis, associate professor of electrical engineering, attempts to couple laser light into a single mode fiber as two students watch and learn. The illustration took place in SDSU's new fiber optic laboratory, which is currently under construction with a completion date of June 2000. Funding for the laboratory has come from the National Science Foundation and the College of Engineering, as well as generous gifts from private donors and equipment manufacturers. When completed, Andrawis said, the laboratory will intrigue students' interest, reinforce theoretical concepts they learn in the classroom, and provide them with hands-on experience in handling optical fibers and optical components. The facility will be used for the instruction and research of electrical engineering, physics, and electronics engineering technology students.

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Alumni Briefs

Kari (Erickson) Christensen '87

recently opened her own business, Christensen Display Products, in Presten, Washington. She lives in Mercer Island, Washington.

Jared J. Gusso '98 works for Sioux Falls Construction Company. He is married to Kari L. Sorensen '98, a nurse.

Arthur J. Helma '50 is retired and living in Aurora, Colorado. He has had his professional engineer's license in that state since 1959.

Curt Motchenbacher '53 has settled in Punta Gorda, Florida, after several years of nomadic ocean living. Curt retired from Honeywell ten years ago, then spent a year at Georgia Institute of Technology rewriting a textbook, Low Noise Electronic System Design. Soon afterward, he and his wife sold their house, car, and furniture and bought a thirty-eight-foot sailboat. Over the next seven years, they sailed around the Caribbean, visiting all the islands, as well as Several countries in Central and South America.

Bill Wohlford '61 is a senior research engineer at Deere & Co. Technical Center in Moline, Iowa. He advises Deere factories on issues involving applications of plastics to farm, industrial, consumer, and construction equipment. He presented "Product Development—A Team Approach" to the Society of Plastics Thermoforming Conference in September of 1998 and "Teaming for Customer Satisfaction and Business Growth" to the Association of Rotomolders Conference in Barcelona, Spain, in March of 1999.

We want to hear from you!

Have you moved, accepted a new position, gotten married, given talks in your community, received an advanced degree, or had an addition to your family? Everyone at the College of Engineering and your classmates want to know what has been happening with you.

Name		Year Graduated
Address		
City/State/Zip _		
Telephone (Degree
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South Dakota State University COLLEGE OF ENGINEERING Crothers Engineering Hall, Box 2219 Brookings, South Dakota 57007-0096



College of Engineering

1999—2000 Events

Oct. 14	College of Engineering Job Fair
Oct. 23	Hobo Day
Oct. 28	Economic Development Task Force Meeting
Oct. 30	FE/EIT & LSIT Exam
Nov. 9	Dean's List Reception for Spring 1999
Nov. 16	Senior Design Conference
Dec. 11	Graduation/Order of the Engineer
Feb. 6-11	Engineering Phonathon

Feb. 20-26 National Engineers Week
March 17-18 Dean's Advisory Council Meeting
March 18 Distinguished Engineers Banquet

April 15 FE/EIT & LSIT Exam April 28 Engineering Expo

May 6 Graduation/Order of the Engineer