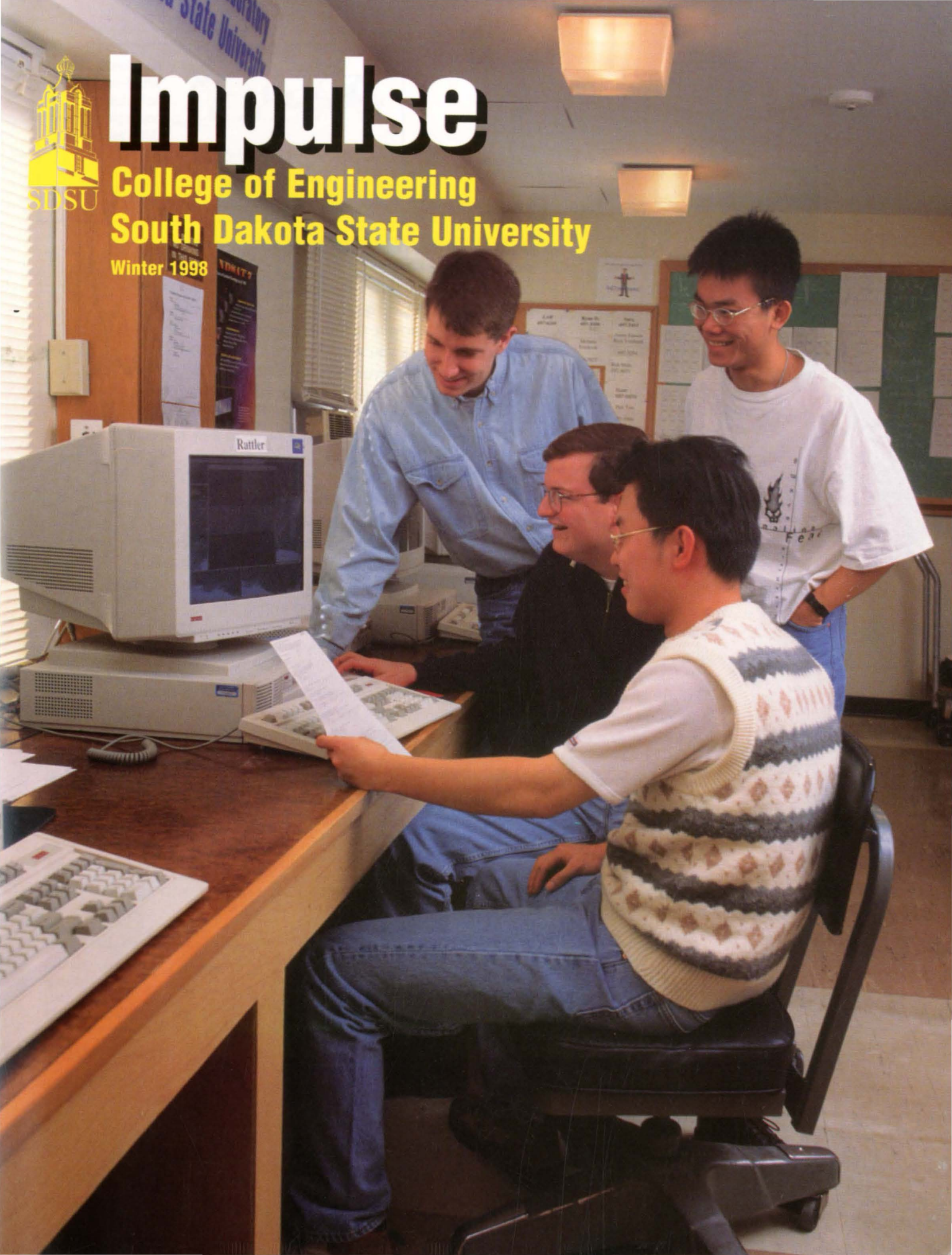




Impulse

College of Engineering
South Dakota State University

Winter 1998





Dear *alumni and friends*

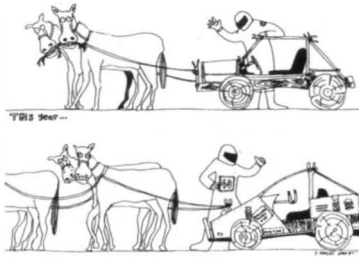
This issue of the *Impulse* will show you some of the people, projects, and expectations of the faculty and students that, when combined, provide the quality education we are proud of in our College. As you will see, quality education is a process that not only involves faculty and students, but you as alumni and future employers of our students. Also, as in previous issues, we will introduce you to successful alumni who are appreciative of the quality education they received at SDSU.

Quality in education does involve the participation of students, faculty, and our constituents who can be the student, parents, and the employers of our graduates. The many unique features of our dedicated faculty, the University atmosphere, student management and communication opportunities, and close interactions with industry are factors we feel are increasingly important. Our students appreciate knowledgeable faculty who are also easy to approach and ready to help at any time. The student-managed functions in the College such as, the annual Phonathon, our Engineering Expo, the Student Design Conference, and the Engineering Career Day are all opportunities for leaders to grow. Cooperative education opportunities and industry presentations in the classroom have become more important for our students to gain experience and to bring practical discussion to the classroom.

As we continually assess and improve our programs, we do appreciate your support and suggestions. I encourage you to provide us with your ideas and comments whether by direct contact with our faculty or through the Phonathon caller when you are contacted.

Duane Sander, P.E., Ph.D.
Dean of Engineering

Drawing on experience—Mathi, a mechanical engineering major, expresses SDSU life through cartooning
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Sarah Ruesch, electrical engineering major, immersed herself in circuit design tasks as a part of the College of Engineering's cooperative education program
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Gifts

Thank you Alyn Holt, Ronald Schmidt, and many others
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The Image Processing Laboratory becomes home to many students involved in research. Electrical engineering students Yoon-Pheng Law (standing on right) and Chun-Shieh Loh (seated on right) provide a demonstration to mechanical engineering students Derek Hengeveld and John Prescher.

Cover photo taken by Dave Ford, Instructional Technologies Center

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Impulse

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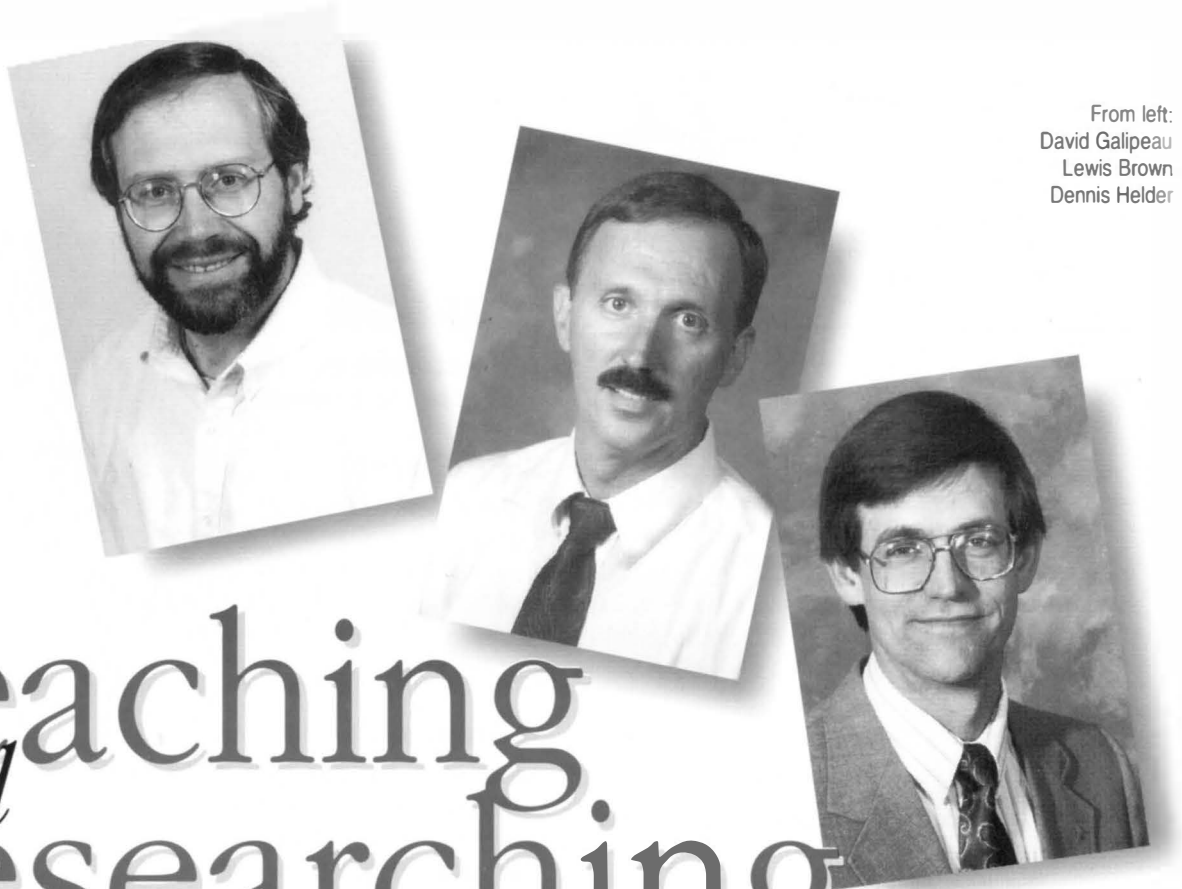
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From left:
David Galipeau
Lewis Brown
Dennis Helder



Teaching *and* researching

If Amy Fowler were a student at a large university, chances are she would graduate and head into her electrical engineering career with little or no research training.

As it is, Fowler is conducting research using microsensors to detect endotoxin levels in the air. Upon her graduation, she will set foot into the work force with two years of research experience on her side.

Such is the story of many students in the College of Engineering, thanks to faculty who are active in the laboratory as well as the classroom. The opportunities for students to assist in research projects are abundant in many departments.

David Galipeau, associate professor in the Department of Electrical Engineering, and Fowler's research advisor, is currently involved in larger research projects involving such things as biosensors and ammonia sensors. He employs six to eight students each year. The lack of a doctoral program, Galipeau says, offers undergraduate and graduate students ample opportunity to assist with research.

Dennis Helder, director of Engineering Research, and associate professor in the Department of Electrical Engineering, focuses much of his research on removing radiometric errors from satellite and aerial imagery. He, like Galipeau, relies heavily on the assistance of students.

"Research is typically done by students. They do the nuts and bolts of it, which frees me up for analysis," he said, "and every

student I currently employ is an undergraduate. They are critically important to what we do."

Students need not be laboratory experts before taking part in research projects, according to Helder. All levels of experience are welcome. "Many projects require students with differing levels of capability," Helder said, "from graduate students with statistics, signal and image processing backgrounds, to undergraduates with basic computer skills. They are all very valuable in labs."

Students' expertise builds as their project progresses, according to Lewis Brown, associate professor and head of the Department of Electrical Engineering, whose research in electrical materials and sensors focuses on high frequency acoustic applications such as medical ultrasound.

"When students complete an assistantship, they are different people," he said. "They are highly polished in design capabilities and technical experience. They do top notch work as engineers and scientists while they are here."

Suzette Burckhard, assistant professor in the Department of Civil and Environmental Engineering, takes special steps to ensure that her student researchers can function in that scientific capacity.

"I have three projects that involve students. One is associated with the effect of vegetation on the movement and degradation of contaminants. The second is a characterization of heavy metal contaminated soil, and the third uses remote sensing in remediation work," she said. "All of these projects are interrelated,

but the students work on different pieces. When they collaborate, they can see how their pieces fit together. It helps them realize that their numbers and results have physical significance.”

Not only do student researchers witness the interconnection and importance of their methods, procedures and results, they often have the opportunity to present their findings to audiences around the world, and publish them in scholarly journals. “I think we have more scientific publications with undergraduate authors and coauthors than any other school in the world,” said Brown. “I haven’t seen that at any other institution.”

Additionally, many of those students who contribute to publications are rewarded for their hard work. Galipeau and his group of graduate and undergraduate coauthors, earned “Best Paper of Session” honors at the 1995 International Symposium of Microelectronics, and the Distinguished Paper Award at the 1994 International Meeting on Chemical Sensors in Rome.

Students as colleagues

Though student researchers initially may lack laboratory experience and a full understanding of the project with which they are assisting, faculty members find great enjoyment in working with them, and watching their skills develop.

“The students are usually enthusiastic and want to learn,” Galipeau said, “and they are highly-motivated, which makes them fun to work with. I enjoy seeing their knowledge and competency levels increase. That, after all, is what we’re here for fundamentally.”

Research and the future

When student researchers cross the stage during graduation, they usually find a smooth road leading to their future. Their experiences in the lab, Galipeau says, prepare them for employment and further study.

“Students leave with a greater breadth of knowledge and technical experience, which is impressive to companies, and attractive to graduate schools,” Galipeau said. “SDSU offers more hands-on experience than Stanford or MIT. Those institutions don’t let students touch certain types of equipment that we have. So their students leave school with less hands-on practical experience that employers are interested in.”

Madeleine Andrawis, associate professor in the Department of Electrical Engineering, who conducts research and teaches courses in the area of electromagnetics, feels that research experience goes beyond indicating a person’s laboratory abilities. That background, she says, indicates that a future employee can handle responsibility.

“Research experience makes students more marketable because it shows employers that they were trusted with important work,” she said. “It is a good quality.”

Research in the classroom

Effects of research reach far beyond the laboratory. Students in engineering classes benefit from the efforts of their researching instructors as well. “What I teach is very theoretical and abstract, and students don’t immediately see how they can use it,” Andrawis said. “Once I tie it to my research, they finally understand, and work harder and better.”

Brown agrees, and adds that bringing research into the classroom is an important responsibility of faculty researchers, and something for which students are grateful.

“I bring my research into class as much as possible, because I think there is an obligation to integrate research and scholarly work that way,” he said. “Students appreciate it, and it gives you a lot of credibility if you can share examples you have encountered, versus teaching straight from the text.”

Burckhard says that she finds it important to help students discover how the class and the research work together, to affect many different parts of their lives.

“I bring into class the general things that students know before they get here, and show them how those things apply to the research,” she said. “The research can then show the students what impact the course has on many aspects of life.”

Recruiting researchers

The College strives to hire faculty members who teach as well as research. According to Dennis Helder, professors who research often become better teachers because of it.

“We recruit faculty to teach and research. They need creative outlets in addition to the classroom,” he said. “It keeps faculty enthusiastic and prevents them from stagnating. It also helps keep students current.”

Galipeau agrees. The enthusiasm he feels toward his research, he says, carries through to his classroom.

“Research gives me a lot of satisfaction,” he said. “Seeing work through to completion is exciting, and it excites me to express that to my students in class.”

For Brown, who entered the world of college teaching after years as a research scientist, leaving behind the research side of his life would have been unacceptable.

“I wouldn’t be here if I couldn’t teach and research,” he said. “I love teaching but my number one goal when I came here was to build an infrastructure to continue my research. It is exciting to be the first discoverer of something.”

Other faculty members, like Andrawis, find that their research, while assisting students’ understanding, also ensures that they, as teachers, continue learning.

“Teaching and researching are important,” she said. “The research part is nice, because I can apply the theory I’m teaching in class. And as long as I’m teaching, I’m learning more about the basics of my research.”

Other benefits

While proving to be an effective part of both teaching and faculty retention, research plays another important role for the College of Engineering—community outreach.

“The research component keeps bright, motivated faculty at SDSU, it flows into the classroom, and eventually flows into nonacademic circles to affect the community,” Helder said. “The research we do here can benefit many South Dakota industries. Our work is a critically important activity to the well-being of the state.”

IAP

Teaching and researching

The College of Engineering's Industrial Assessment Program (IAP), while not research based, offers students some important hands-on experience.

"Our program is more outreach than research, but it is more application oriented than some research might be," said Kurt Bassett, IAP coordinator, and associate professor in the Department of Mechanical Engineering. "It is the type of thing students might actually end up being involved with someday."

SDSU's IAP, one of twenty-nine others around the country, began in 1992. Funded by the Department of Energy, the program originally focused solely on improving the energy efficiency of manufacturing and processing facilities. Today the program provides energy, waste, and productivity assessments, at no charge, to small and mid-sized manufacturers. Since its inception, SDSU's IAP has assessed the operations of more than 125 plants in a 150-mile radius of Brookings.

According to Bassett, who employs an average of six students in the program each year, the experience provides students with valuable career skills.

"Students visit these facilities with us to take measurements, and they prepare documentation to show cost savings," he said. "Not only do they get to use instruments, they get to talk with people, from plant personnel to vendors, which is a good opportunity to develop communication skills."

The students' work in those plants, Bassett says, is both appreciated and respected by plant owners and managers.

"A few times each year the Science Center located in Philadelphia, which is the program manager for the IAP, interviews the companies we have served," said Bassett. "They always mention how impressed they are with our students' professionalism. The companies mention that without being asked."

According to Bassett, that professionalism and experience pay off for IAP workers. After surveying his former employees, he was pleased to discover that the IAP affiliation assisted many of them in securing professional employment.

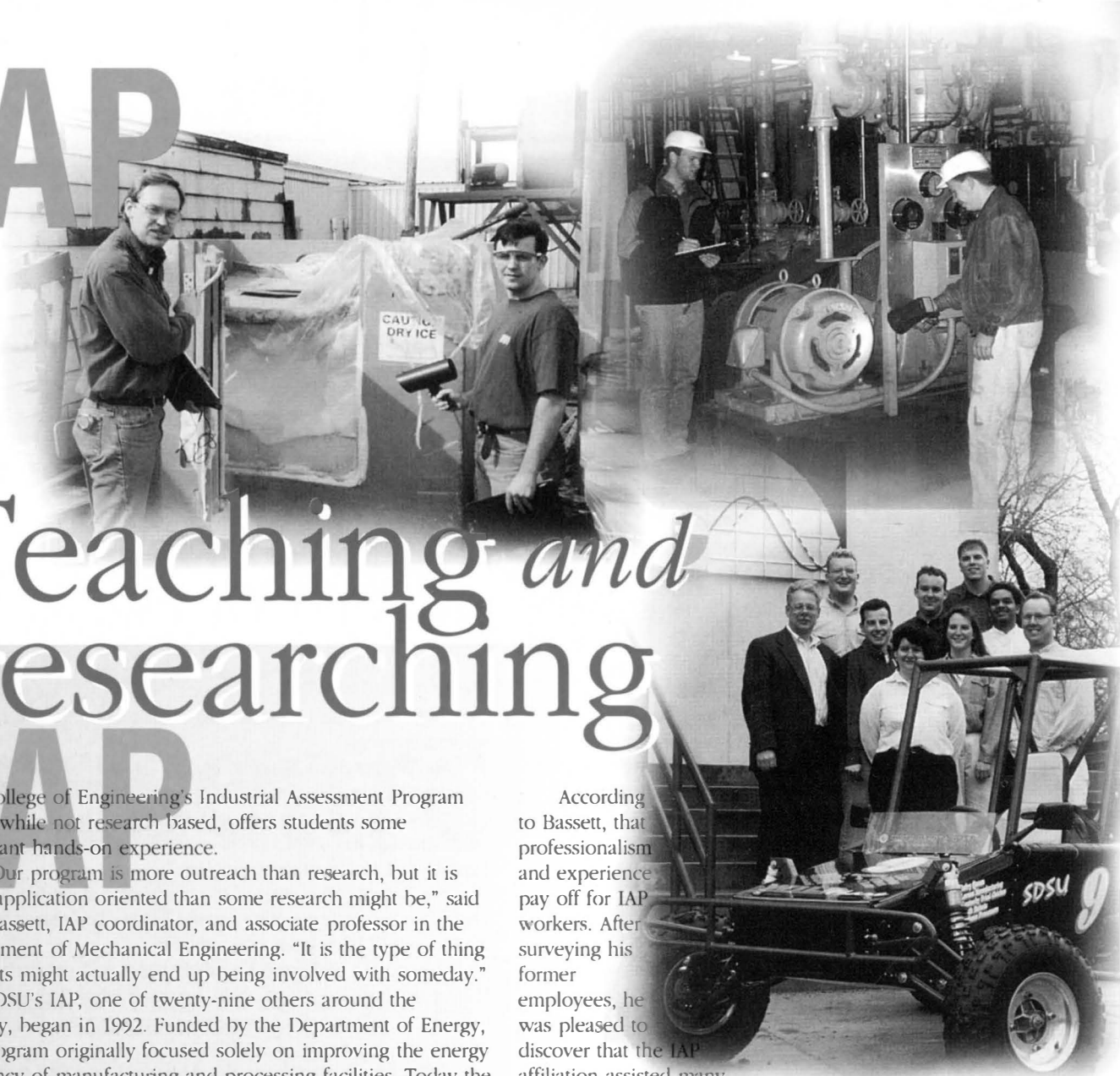
"Eighty-five percent of those surveyed said the primary reason they were offered the job they are in, is because of their experience in this program," he said. "Most are working in manufacturing and utility companies, or as consulting engineers."

The benefits of the IAP reach into Bassett's classroom, too, ensuring that students who aren't directly involved in the program can learn from it.

"Each time we go into a company, we learn something new," he said. "So it is easy to bring back those experiences and applications and share them with our classes."

While the program is an important outreach activity for the College of Engineering, Bassett stresses that its greatest value comes from what it brings to SDSU students.

"The biggest benefit of this program is the educational opportunities for students," he said. "It helps them figure out where they're going, and they can hit the ground running when they start working."





Learning *cooperatively*

"I liked that all of the technology was cutting-edge. In school we do circuit design tasks in an ideal world. But I found that in industry, things move so much faster. It was amazing, and it challenged me to keep up with the technology."

As a hardware intern last summer, Sarah Ruesch not only applied her classroom learning while discovering more about the engineering industry, she ensured her place in the job market as well.

For three months, Ruesch, a senior electrical engineering major from Fulda, Minnesota, engrossed herself in circuit design tasks such as simulation and schematic capture, and CMOS design for the J90 air-cooled super computer by Cray Research, a Silicon Graphics Company, in Chippewa Falls, Wisconsin. The experience was part of the College of Engineering's cooperative education program, which is designed to combine learning with relevant work experiences, while preparing them for a smooth transition to employment.

Virgil Ellerbruch, professor and assistant dean in the College, says the program, though not required for graduation, is valuable to students as well as employers.

"Cooperative education experiences—or internships—offer students exposure to the profession, the industry and the workplace, while providing hands-on experience," he said. "Employers use those experiences not only to build their potential job pool, but to observe students during their formative years, and see how they think and approach the profession, too."

Lewis Brown, associate professor and head of the Department of Electrical Engineering, finds that students who participate in work-learn activities, develop a new attitude about their future.

"Students return from those experiences both excited and motivated," he said. "I see a big difference in many of them when they come back to school."

Ruesch's experience at Cray Research was no exception. Working with new equipment and expanding her classroom learning, helped her discover new excitement toward her eventual career.

"I liked that all of the technology was cutting-edge. In school we do circuit design tasks in an ideal world. But I found that in industry, things move so much faster. It was amazing, and it challenged me to keep up with the technology," Ruesch said. "I also learned industry applications that I will be able to use in other jobs."

Opportunities like Ruesch's are more plentiful than ever. In just the last few years, says Brown, the number of internships available to SDSU's engineering students has increased four-fold.

"Between 1995 and 1997, the need for interns has quadrupled," according to Brown. "It is incredible because the opportunities and choices couldn't be better for students than right now. But it is disappointing too, because a number of the companies that contacted us had hired SDSU students before, and prefer our students, but we just don't have the numbers to fill those vacancies."

Students need not wait until their final year to join the internship pool. According to Brown, they can secure part-time school year, or full-time summer employment, as early as their freshman year.

"There are companies out there, such as Daktronics, that recruit heavily at the end of the freshman year, for basic wiring and assembly duties," Brown said. "As those students complete more technical courses, they move into more technical positions at work. Before they graduate, many are already working as engineers."

The College of Engineering offers students several different cooperative education options, from the alternating plan which requires students to work at least two full-time work periods separated by a full-time study period, to the parallel plan which allows students to work and take classes simultaneously.

Additionally, several departments within the College offer credit for students' cooperative education experiences. While a popular option, Brown says, many students opt to complete their internships without earning credit toward their degrees.

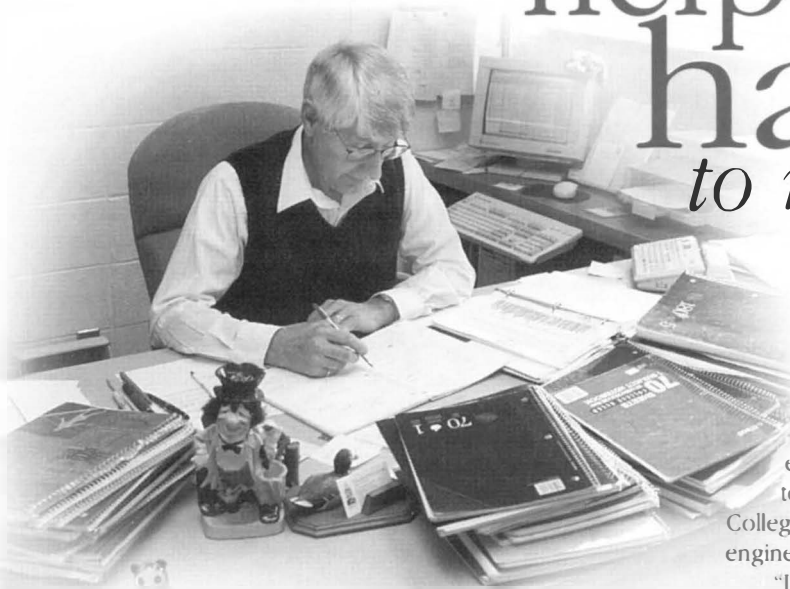
"At least half choose to complete those jobs without credit," Brown said. "Many still want to use the cooperative education experience for credit. But with or without credit, the jobs are still rewarding positions."

Ruesch agrees. Whether or not they choose to work for credit, all students, she says, should take advantage of the opportunities available.

"I think students have to intern," she said. "The more experience persons have, the better their chances are of finding a job when they're done with school. Companies want experience."

Engineering course offers a

helping hand to new students



When new students in the College of Engineering have questions about study methods, are curious about different areas of engineering, science, and technology, or just need advice about careers, they needn't go any further than one of their classes.

"Introduction to Engineering and Technology," a required course for all new engineering, science, and technology students, has been part of the curriculum for decades. The goal of the course, which has undergone changes over the years, is student development—personally, academically, and professionally.

Virgil Ellerbruch, assistant dean and professor, is teaching the course for the first time during the fall semester. To aid in the achievement of student development, Ellerbruch has students focus on goal setting, and time and resource management. He also emphasizes determination, effort, and energy, he says, and stresses the importance of developing an approach to becoming a good student, and eventually a successful professional.

"Introduction to Engineering" is based partly on the work of Raymond Landis, dean of Engineering and Technology at California State University in Los Angeles. Twenty-five years ago, Landis used a National Science Foundation (NSF) grant to develop a course for minority students, to help prepare them for college. He adapted the course for many different areas, and wrote *Studying Engineering: A Road Map to a Rewarding Career*, a book that Ellerbruch uses for his class.

According to Ellerbruch, the course uses many of the same approaches that Landis suggests, including having the students keep journals. "The students write in their journals each time they're in class," Ellerbruch said. "Not only do they serve as a permanent record for the students, as they contain their short-

term, intermediate, and long-term goals. The journals also help them develop and improve their writing skills."

Another aspect of the course, Ellerbruch says, is exploration, for which he enlists the assistance of speakers to help familiarize the students with the University, the College of Engineering and its programs, and the engineering industry.

"I have members of the administration and the College of Engineering faculty come and speak to the class, as well as representatives from industry," he said. "It helps expose them to SDSU, and to a wide variety of engineering, science, and technology fields."

As important as that exposure, Ellerbruch says, is the students' preparation to work in those fields. One requirement of that preparation, he explains, is teaching individuals to function in teams. "I emphasize team effort, encourage it, and require it. Students need to understand that we can't work alone as a nation, and that people can't work alone in business," he said. "Ours is a global society, and engineering, science, and technology are no different. People need to learn to reach out to others, to form teams, and to work together."

Ellerbruch commends the high schools on preparing students for that environment. "It used to be that in high school, students competed—they didn't cooperate," he said. "Now students are entering college more prepared to work in teams. That's important."

For Ellerbruch, teaching the course's two sections of one hundred students each, presented a new challenge, but one that he enjoyed.

"I've never taught that many students at one time before. I enjoy bringing them information that may be something they relate to down the road, either professionally or personally," he said. "Ultimately I hope they experience some personal development, and that their goals for the future will be clear."

Judging from student feedback, Ellerbruch need not worry about those details. The course, they say, not only offers variety, it helps them begin successful student careers, and teaches them more about the engineering profession.

Students Call on local telephone company

"I like the class because it is different every day," said Rachel Quam, a freshman from Huron. "We have speakers from campus and different companies, which is a nice change from a straight lecture. We also learn what is expected of us in the next three to four years, and talk about different things that are happening on campus, like registration deadlines. Since we're new to campus, we aren't aware of some of those things."

Thad Kneebone, a freshman from Jefferson, agrees, and attributes his newly realized interest in construction management, to the class visitors.

"I came from a small town, and had never learned about the different areas of engineering," he said. "In this class, because of the speakers, I've gained a better understanding of the different engineering fields. Each of them explained their field, the course requirements, starting salaries, and the types of things you'd be doing on the job."

Perhaps one of the most important parts of "Introduction to Engineering" is that it helps students determine, early in their college careers, whether or not they want to venture into the world of engineering. Helping make her feel comfortable with her choice of major, said Quam, made the course worthwhile.

"The class helped me realize that I'm really interested in engineering," she said, "and that I've made the right decision."

Opposite page: Virgil Ellerbruch comments in the journals produced by the two hundred students enrolled in "Introduction to Engineering." Ellerbruch says that from the journals he can observe the students' progress, growth, and thought development. He also discovers improvements in their use of punctuation and grammar.

Thanks to the cooperation of a Brookings business, students from the College of Engineering recently gained a greater understanding of telecommunications technology and the complexities involved when doing something as simple as calling their next door neighbor.

At the end of the fall semester, seventeen students from the communications engineering course took part in a tour of the Brookings Telephone Company, led by Bruce Dixon, plant superintendent. The tour has been part of the class for the past five years.

Alfred Andrawis, associate professor in the Department of Electrical Engineering, and course instructor, developed the tour as a way to offer students a better understanding of the way in which communication equipment interconnects to complete the complicated process involved in making a local phone call.

"Students like to see hands-on, practical applications for the theories they learn in the classroom," he said. "It helps to make concepts clearer."

During the tour, students learned more about the interface between outside calls and exchanges, as well as methods used to locate breakage and weak points in fibers. Ryan Stahl, a senior electrical engineering student, found the information a valuable supplement to what he learned in class.

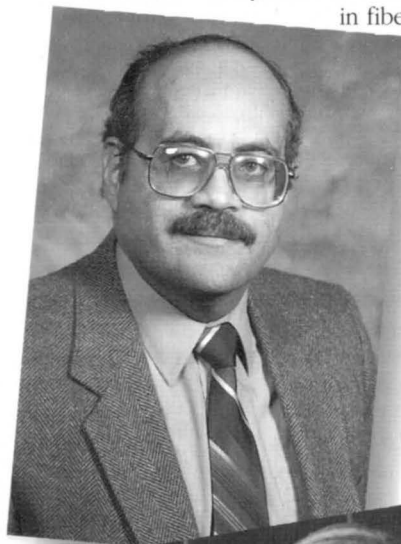
"I thought it was really interesting. I'd never been exposed to that kind of technology before, and had never seen how it works," Stahl said. "I learned a lot from [Dixon]. He is a knowledgeable person, and did a good job of showing us things."

The Brookings Telephone Company, Andrawis says, is always eager to assist the students in their learning. "We really appreciate their cooperation," he said. "Brookings Telephone Company is the only place in Brookings with that particular collection of equipment."

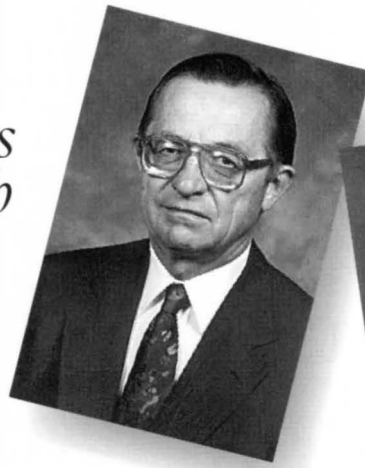
According to Dixon, he and his colleagues are more than happy to accommodate the class. They'll do what they can, he says, to broaden people's understanding of the company's technology.

"We like to give others the opportunity to see what we have here. There are a lot of people who don't understand all of our services," he said, "and I think students appreciate seeing the technology in use."

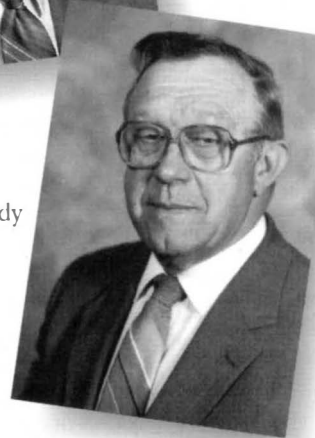
Bruce Dixon (pictured on the far right), from the Brookings Telephone Company, explains some of the intricacies of telecommunications technology to SDSU students on tour.



Retired professors helping students through The Gray Team



Gray Team members, from left: Wayne Knabach, Jim Dornbush, Clayton Knofczynski



Scholarships and support are crucial to many students in the College of Engineering, and nobody knows that better than former faculty members. A clear understanding of students' needs prompts many retirees to continue sharing their financial resources and engineering expertise long after they officially step down from teaching.

While alumni and engineering-related businesses are major sources of scholarships, retired professors have always been generous supporters of SDSU engineering students. Some establish their own scholarships, while others are honored through scholarships created by friends and family.

The Trapp Family Scholarship falls into the latter category. Lansford Trapp, Sr., a former assistant professor of mathematics, funded the scholarship endowment with his wife, Frances, and the five SDSU alumni among their seven children. Since 1991, the award has rotated among the Physics, Electrical Engineering, and Mathematics departments.

The scholarship has been described as the result of a "fifty-year love affair" between the Brookings family and SDSU. Lansford Trapp, Sr. earned a bachelor's in engineering physics in 1948 and taught mathematics at his alma mater from 1967 to 1983. During Trapp's career at SDSU, four of his sons earned degrees in electrical engineering and one earned a degree in physics.

When they established the scholarship, Trapp family members called it "an expression of appreciation for the educational and career opportunities received by the family." That kind of generosity is extremely important to SDSU engineering students, said Duane Sander, dean of the College of Engineering.

"Scholarships help students in two ways," Sander said. "First, students always have a financial need, and our scholarships help through tuition reduction and assistance in purchasing books, equipment, and, increasingly, personal computers. The second way scholarships help students is in the encouragement they provide to

recipients to continue to study and maintain excellent academic performance."

Another generous scholarship created in honor of a former faculty member is the John R. Andersen Memorial Scholarship in Engineering, which provides two awards each year to students interested in environmental engineering. Friends and colleagues of Andersen, a former professor of civil engineering, established the scholarship endowment in 1973. Among the award's biggest advocates is James Dornbush, Andersen's former office mate, who retired from the Civil Engineering Department in 1990.

The following is a sampling of the types of scholarships available to students in the **College of Engineering**

Open

- Stephen F. Briggs Scholarships: \$2,500 each, renewable for four years, to six engineering majors
- Mangels-Jensen Scholarship: \$2,000 to an engineering major with a 3.0 GPA, leadership skills, and history of involvement, with preference to students from Hamlin County planning careers in power engineering
- Everett W. Dunn Scholarship: \$1,400 to any engineering major

General Engineering and Technology

- Brookings Economic Development Corporation Scholarship: \$1,000 to a junior or senior majoring in manufacturing engineering technology, with preference to students from Brookings or nearby counties
- Association of General Contractors Scholarships: varying number and amount of awards to students in engineering and technology fields with emphasis in construction management

Civil and Environmental Engineering

- South Dakota Cement Plant Scholarships: \$1,000 each to two graduate

students and three undergraduate students who are South Dakota residents interested in the construction field

- Arlo and Barb DeKraai Scholarship: \$1,000 to a civil engineering major
- Alisa Prunty Memorial Scholarship: currently about \$600 to an active civil engineering major, with preference given to students from Bon Homme High School

Computer Science

- Gerald and Shirley Bergum Scholarship: full tuition to one junior or senior computer science major
- Dickinson Family Scholarship: \$500 to one junior computer science major
- American Express Special Teams Scholarship: \$1,000 to a computer science major, with preference to students working for Special Teams

Electrical Engineering

- Charles W. and Lillian K. Mueller Scholarship: \$2,500 to a sophomore or junior electrical engineering major with a 3.0 or better GPA, with preference to students participating in instrumental music at SDSU

A former member of the Engineering Scholarship Committee, Dornbush has contributed and encouraged contributions to the Andersen scholarship endowment. For Dornbush, retiring did not mean giving up on that goal. Since then, he has taught courses, substituted for absent professors, and done consulting. His motivation is not boredom or obligation, but the opportunity to stay involved.

"That's the kind of thing I enjoy doing, just helping out when somebody needs it," Dornbush said. "All my life I've worked closely with college students, especially graduate students, and followed them after they leave. I just like to work with students."

That is the reason that many "retired" engineering professors are better described as "semi-retired." Sander and others in the College of Engineering informally refer to a group of Brookings-area former faculty members as The Gray Team, a term coined by former dean Ernest Buckley. Buckley made creating camaraderie and family atmosphere throughout the College a priority, Sander said, because he recognized that former faculty members could be an invaluable resource.

Sander has certainly found that to be true. When he needs assistance with a project, he feels confident in calling on any member of the Gray Team.

"They are all very interested in the University and the College and their profession," Sander said. "Therefore, they continue to contribute in many ways. In some cases, they use their expertise to tutor students or help in the classroom. In other cases, they help when we need assistance in some of our activities, such as

Engineering Expo. They also continue to be active in terms of professional organizations after they've retired."

For Clayton Knofczynski, who retired from the Department of Mechanical Engineering in 1990, staying active usually means answering in the affirmative to requests from both faculty members and students. The former professor and department head occasionally substitute teaches on campus, and he tutors students who need extra help. Like Dornbush, he is motivated to spend some of his retirement time on campus because he loves students.

"I particularly enjoyed teaching," said Knofczynski. "I didn't like some of the administrative things, like filling out forms and reports. My pride and joy was just pure teaching."

Knofczynski also stops in at the College office occasionally, either to have coffee with former colleagues or just "to see how things are going." The College staff appreciates those visits and encourages former faculty members to stay in touch, said Barb Dyer, administrative assistant in the College. "The majority of them are invited to almost all the events we have, such as the Engineering Awards Banquet and the Spouses' Luncheon," she said. "We try to make them feel as involved in the College as possible. We really benefit from that, because they're great for mentoring when we need it."

One former full-time faculty member who never so much as took a break from those mentoring activities is Wayne Knabach. Since he "barely retired" as a professor of electrical engineering in the spring of 1995, he has conducted seminars, managed the Center for Power Systems

Studies, and taught a special problems class.

Although Knabach is reducing his duties this semester, he will be available to teach courses when needed and share his expertise with the current faculty. Serving the College on a part-time basis offers him the best of both worlds, Knabach said.

"If something has been your career for forty years and you enjoyed it during that time, you're still going to enjoy it," he said. "Being involved with students is enjoyable, and this permits me to do so in a limited capacity. I'm not in the pressure cooker like a full-time staff member."

And, as Clayton Knofczynski pointed out, there may be one other benefit to staying involved in the education of SDSU's engineering students after retirement: "It keeps you young."

Above: Hobo Day 1947 brought two civil engineering students together: Jim Dornbush '49 (left) and Marv Schaeffer '50. Both graduates are natives of Pollock, South Dakota.



- Center for Power Systems Studies/Alumni Scholarship: \$2,400 to a senior electrical engineering major with a 3.0 or better GPA and an interest in a career in power systems or a related area

- Interstates Electric and Engineering Scholarship: \$750 each to two incoming junior or senior electrical engineering majors with GPAs of 3.0 or better who have demonstrated aptitude and potential for careers in electrical engineering, with preference to students pursuing the Power Systems elective-

Mechanical Engineering

- James and Catherine Grommersch Scholarship: \$700 to a mechanical engineering major
- Northwestern Public Service Scholarship: \$500 to a junior mechanical engineering major, preferably from eastern South Dakota
- 3M Scholarships: \$500 each to five or six mechanical engineering majors (the sixth scholarship alternates annually with electrical engineering) with a minimum GPA of 2.5

Physics

- Frosie Memorial Scholarship: \$900 to a junior physics major
- Reinhart Scholarships: \$500 each to six physics majors
- Lynch Memorial Scholarship: \$250 to a senior physics major with an interest in music

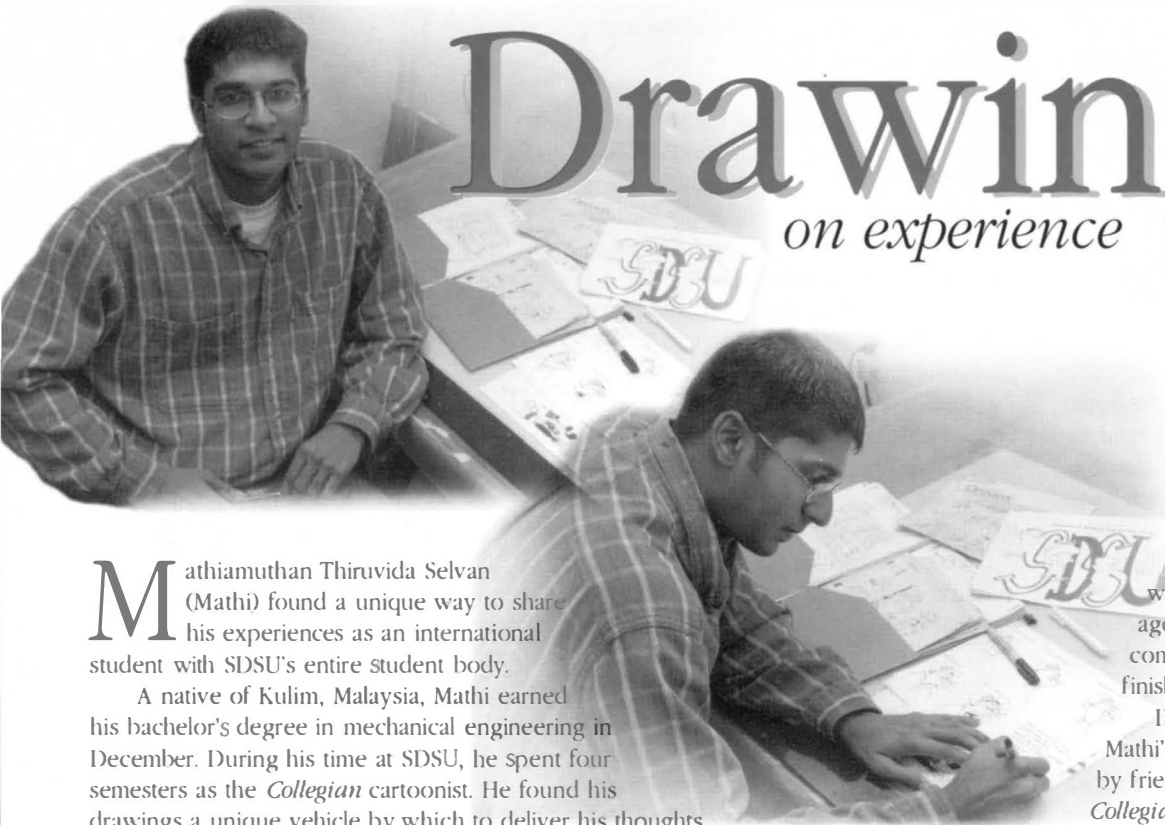
Mathematics and Statistics

- Eileen Wente Scholarships: full tuition to four junior mathematics majors who show potential
- Clemen-Pettigrew Scholarship: \$500 to a junior or senior mathematics major
- Helen Engebretson Scholarships: full tuition to one student who has taken a geometry course and to one other mathematics major

If you are interested in establishing a scholarship, contact Edd Storey, Interim Director of Development, SDSU Foundation, 823 Medary Avenue, Box 525, Brookings, SD 57007, or call 1(888)747-7378.

Students

Drawing *on experience*



Mathiamuthan Thiruvida Selvan (Mathi) found a unique way to share his experiences as an international student with SDSU's entire student body.

A native of Kulim, Malaysia, Mathi earned his bachelor's degree in mechanical engineering in December. During his time at SDSU, he spent four semesters as the *Collegian* cartoonist. He found his drawings a unique vehicle by which to deliver his thoughts and feelings to others.

"I believe pictures are the most effective way to send a message," he said. "I liked sharing my experiences during my stay at SDSU, such as how I felt about my friends, college, and current events."

Mathi came to SDSU in the fall of 1995, after completing two years in the American Degree Program (ADP) in his own country. ADP is a two-year plan that offers courses in the humanities, social sciences and basic sciences. Students eventually finish their undergraduate degrees at universities in the United States. "I came to SDSU because one of my instructors in the program had graduated here a few years earlier," he said. "He recommended it to me."

Once engrossed in his studies in the College of Engineering, Mathi found he had limited free time for one of his favorite hobbies—painting. So he fell back on cartooning, something that required less time.

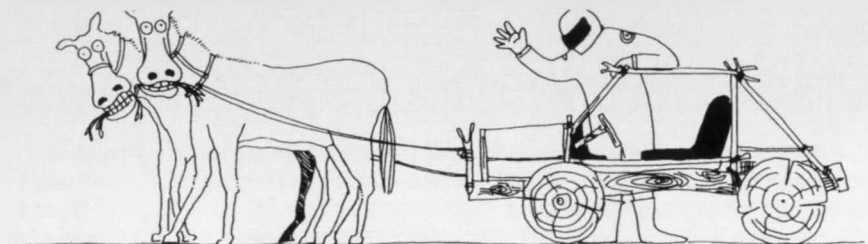
"I'm an artist. I like to paint. But I didn't have time for it when I was in school," he said. "I started scribbling on my class notes, and then I saw the *Collegian's* ad for a cartoonist, and applied. I started drawing for them spring semester of 1996."

Mathi's only other experience with cartooning came a few years ago, when he entered a national competition in Malaysia. His work finished tenth out of 1,000 entries.

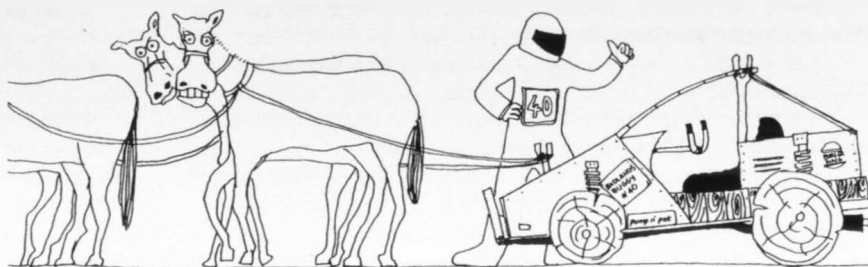
Despite limited previous training, Mathi's cartoons were well-received by friends, professors, and the *Collegian* staff.

"I heard many good comments from my friends," he said. "At the end of last spring semester, the editor told me that I didn't need to reapply. Everyone thought I had done a good job, so they went ahead and gave me the job for another semester."

Mini-baja team looks to improve last year's performance



THIS year...



T. MATHI JAN 97

While his cartoons required less of his time to create than his paintings, Mathi admits that it was challenging finding new ideas for each issue of the newspaper.

"Sometimes, I would come up with a really funny one, and I think people expected that every week," he said. "And mostly I know about engineering, so sometimes it was hard to come up with cartoon ideas from different areas."

Since graduating, Mathi has returned to Malaysia to find employment and to be closer to his family. Though he enjoyed his cartooning experience, he says he hopes to spend his free time in other ways.



"I'm not sure about cartooning in the future. I might, if I have the chance," he said. "But mostly I'd like to do some painting, and play a lot of tennis."

Now that he is back in the year-round summer climate of home, Mathi confesses that part of him will actually miss the South Dakota winter.

"I didn't do a lot of things outside in the winter," he said. "But I can say that I survived one of the worst in the state's history!"

Perhaps his fondest memory of his time as a student at South Dakota State University, are the friends he made, even though it wasn't always easy for him.

"When I first arrived in the United States, I found the country totally different, and I had a hard time going along with Americans," he said. "But I decided that if I wanted to make friends with the American students, I would just have to go for it; and now I've got a lot of friends. I appreciate those friendships that I made at SDSU, with students, staff members, professors, and deans."

Student enjoys stellar summer

Ryan Eidem spent the summer with his eyes to the skies as part of a special research program.

Eidem, a senior physics major, participated in the 1997 Research Experiences for Undergraduates program sponsored by the National Science Foundation. One of thirteen students chosen from a pool of 225 applicants, he spent six weeks studying variable stars at East Tennessee State University, one of five universities participating in the program.

Throughout the summer, Eidem was involved in a myriad of activity, including studying pulsating stars, developing light curves on mira variable stars, and analyzing the extinction of the atmosphere at the site in Tennessee. He also attended a number of workshops on observational techniques, data reduction, current events in astronomy, proposal writing, job opportunities in astronomy and scientific ethics.

In addition, he attended two different meetings—in Melbourne, Florida, and Valdosta, Georgia—of all the mentors and students in the program. At the final meeting, Eidem presented his research results on near infrared photometry of mira variables.

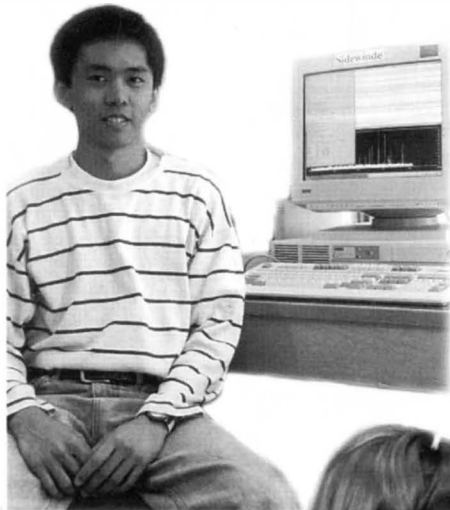
But for Eidem, one of the highlights of the summer was an excursion to the Southeastern Association for Research in Astronomy at Kitt Peak in Arizona. At this site, students had the opportunity to observe the night sky through a 0.9-m telescope.

"We were able to observe every night that we were there because the sky was so clear," Eidem said. "It was really beautiful."

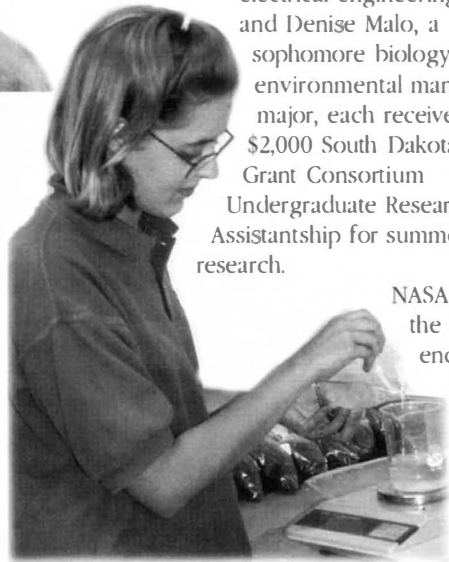
Though an astronomy enthusiast for many years, the program offered Eidem an opportunity to learn even more about the field, and convinced him to continue his astronomical studies. "I learned a lot about the different aspects of astronomy, like observing and data, and I really enjoyed it," he said. "It was a whole lot more than just star gazing. It really piqued my curiosity and made me want to learn more about the field."

While he is considering a career in teaching and research outside of astronomy, Eidem says that he would welcome continued participation in astronomy-related activities. "I really enjoy it," he said. "I'd like to stay involved with it somehow."

Currently, Eidem is in the process of writing a paper about his experiences for the International Amateur-Professional Photoelectric Photometry (IAPPP), and is preparing a colloquium for the Physics Department.



Students
receive
undergraduate
research
assistantships



While other college students spent the summer resting up from the last school year or earning money for the next, two South Dakota State University undergraduates worked on research funded, in part, by NASA.

Seng Suan Goh, a senior electrical engineering major, and Denise Malo, a sophomore biology and environmental management major, each received a \$2,000 South Dakota Space Grant Consortium Undergraduate Research Assistantship for summer research.

NASA supports the awards to encourage students to pursue careers in fields related to aeronautics

or space. Under the guidance of faculty mentors, grant recipients participate in aerospace-related research projects which may be parts of the mentor's ongoing research or separate activities developed jointly by the student and the mentor.

Goh, advised by Dennis Helder, associate professor of electrical engineering and director of Engineering Research, spent his summer working full time to improve the clarity of satellite images. He focused on images that are captured by Landsat, then sent back to Earth and stored at EROS Data Center.

When the Landsat satellite beams images back to Earth, Goh said, its own hardware often creates a distortion known as coherent noise, which results in tiny lines within the images. The images may also suffer from environmental factors. "Satellite images taken from space are not perfect because parameters like temperature, atmosphere and optics affect the data," Goh said.

To clarify the distorted images, Goh is using Interactive Data Language to write a code that will filter each section of an image. Because this may require as many as 1,300 separate filters for a single satellite image, the process is painstaking and slow. However, the work will be worthwhile if the completed code works for a wide range of images, Goh said.

"I am now working on a daytime image from Lake Erie," he said. "I hope my filter will apply to other images, too."

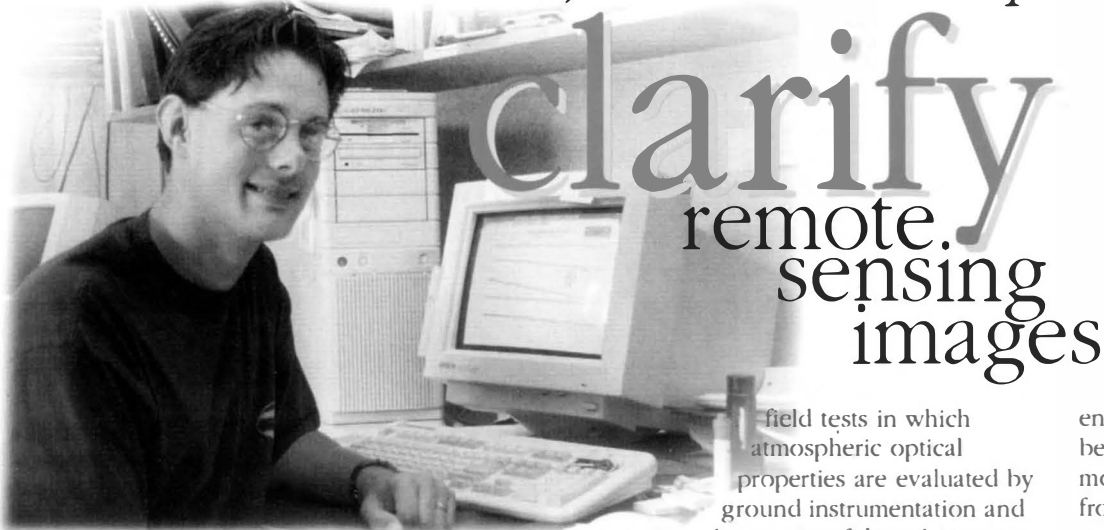
While Goh looks to the heavens, Denise Malo focuses on the ground beneath her feet. She is assisting David Clay, associate professor of plant science, with ongoing research for the USDA by reviewing the soil nitrogen mineralization of an SDSU field plot. After gathering soil samples and examining aerial photographs, she analyzes the soil for substances such as herbicides, carbon dioxide and nitrogen.

One surprising aspect of her work, Malo said, is the wide range of readings it produces. "The really interesting thing about the field is that it was spread with manure, and I'm getting a lot of different numbers, so there's a lot of variability," she said. "Some of the plants are chest high, and some are nine feet high."

Malo expects her research to have both agricultural and environmental applications. Her results could help farmers determine how much manure, fertilizer or herbicide is safe to apply and how the applications might affect the groundwater.

"At the end of the project, we'll be able to see and interpret how different levels of manure and soil microbes and minerals all work together and how they can play a role in precision farming techniques," she said. "It will be interesting to see the whole big picture."

Faith native, SDSU student helps



clarify remote. sensing images

If you've ever been frustrated by a fuzzy snapshot, you've got an inkling of what it's like to try to garner data from a satellite image distorted by atmospheric conditions.

That is just the problem that Steve Hawks, a senior physics major, hopes to help solve. Since the summer of 1996, he has worked with Stephen Schiller, associate professor in the SDSU Department of Physics, to improve the accuracy of data gathered through remote sensing instruments.

"When planes or satellites fly over the earth and take surface pictures, they're calibrated for ideal conditions," Hawks said. "But usually there's a haze in the air. We're trying to come up with a model to take into account the sky conditions and correct for problems introduced by the haze."

Through a project involving several SDSU faculty members and funded by the state of South Dakota and the National Science Foundation through its Experimental Program to Stimulate Competitive Research (EPSCoR), Hawks has helped Schiller set up and conduct

field tests in which atmospheric optical properties are evaluated by ground instrumentation and by an aircraft-based imaging system. He has also assisted in analyzing the resulting data, sometimes writing computer programs for that purpose.

"Steve is a very hard worker," Schiller said. "He puts all the effort he can muster into participating in the things we're working on. I've been really pleased with his performance."

Because the work Hawks is doing will contribute to the removal of atmospheric effects on remote sensing imagery, it will have broad benefits. It applies directly to NASA's Mission to Planet Earth, a program to study global environmental change, Schiller said. Closer to home, it has applications for agriculture, which increasingly uses remote sensing to determine where a field has received too much fertilizer or too little water, among other things.

"A lot of the focus in this area has been on precision agriculture," Schiller said. "With remote sensing imagery, you can map out the characteristics of an entire field on a computer and evaluate it and compare it to what you notice on the ground as you work the field. That type of work is

enhanced when you can get better spatial resolution and more detailed information from your images."

Naturally, Hawks has learned a lot about the EPSCoR project, but his work has been helpful in other ways, as well. "It's given me the chance to have hands-on experience with physics," Hawks said. "It's also given me an idea of what research is like. I don't know if I'd go into the same area, but research is still a career area that interests me."

Hawks has enhanced his experience by presenting papers based on his research at two professional conferences, including a recent EPSCoR Conference in Brookings. "Whenever an undergraduate student can present papers on professional research, that sets him well above the crowd," Schiller said.

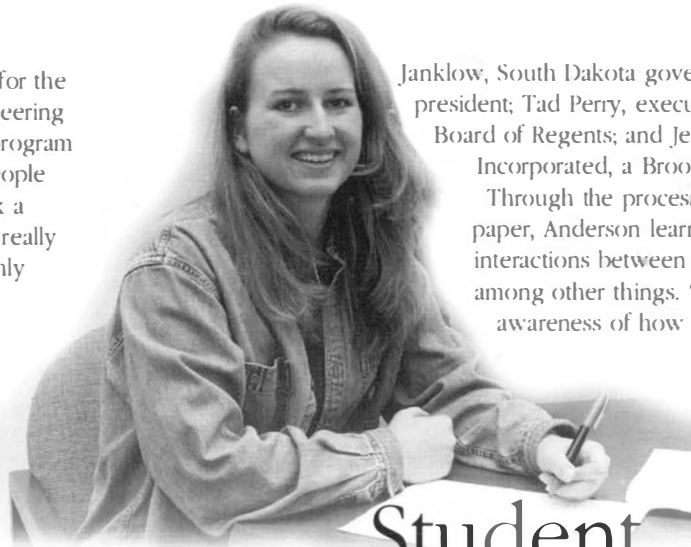
This summer, however, Hawks did interrupt his work long enough to marry Paula Hagel, an SDSU biology major from Flandreau.

■ Students

When the first classes for the Manufacturing Engineering Technology (MET) program were offered in the fall, few people probably realized how complex a process the program's creation really was. One person who thoroughly understands that complexity is Tracy Anderson.

Anderson, a senior political science and Spanish major, received a \$1,250 Schultz-Werth scholarship for her examination of the development of the MET program. Focusing on "the complexities that occur within the administration," she traced the process from the recognition of the need for manufacturing technology education in South Dakota to the implementation of the degree program in the College of Engineering.

In addition to studying printed sources, Anderson gained information by interviewing several individuals involved in the development and implementation of the program. They included William



Janklow, South Dakota governor; Robert Wagner, retired SDSU president; Tad Perry, executive director of the South Dakota Board of Regents; and Jerry Luetzow, president of MTR Incorporated, a Brookings manufacturing business.

Through the process of researching and writing the paper, Anderson learned about the complicated interactions between higher education and politics, among other things. "This project enhanced my awareness of how to go about solving an issue that is important," Anderson said.

"Awareness of how a system works can be very beneficial."

Upon graduation, Anderson plans to attend law school or pursue a master's degree in public administration. She hopes someday to practice international law,

combining her interests in law and Spanish.

Seniors who present in-depth research papers which exemplify original research and creativity are eligible for Schultz-Werth Awards ranging from \$250 to \$2,500. The award is funded by Theodore Schultz, a Nobel Laureate in Economics, and his wife, Esther F. Werth, both South Dakota natives with a strong belief in the importance of investing in people through education.

Student honored for study of MET program

Society of Women Engineers hosts holiday open house



Dozens of students, staff, and faculty enjoyed holiday treats at the SWE open house held December 12. The student group, advised by Madeleine Andrawis, provides another professional organization for women engineering students at SDSU. Pictured at left are Alfred Andrawis, associate professor of Electrical Engineering, and Matt Asche, a



senior majoring in electrical engineering and engineering physics. Also taking time to visit are Angeline Teng, a civil engineering student, and Suzette Burckhard, assistant professor in the Department of Civil and Environmental Engineering.

Broulik

receives Space Grant Consortium assistantship

“This project will really benefit the producer. With increased input costs, farmers need every edge to remain competitive in today’s global market.”

Brian Broulik, a graduate student in the Plant Science Department, has received a graduate assistantship from the South Dakota Space Grant Consortium for the 1997-98 academic year.

The Consortium is a program funded in part by NASA. Its members include SDSU, the South Dakota School of Mines and Technology, Augustana College, and the EROS Data Center. A goal of the Consortium is to create an enthusiasm for aerospace sciences among students. The specific purpose of the graduate research assistantships is to encourage students to pursue careers in fields related to aeronautics or space.

Broulik, the first non-engineering student to receive the assistantship, will focus his research on the application of remote sensing techniques to precision agriculture. Broulik’s previous experience with remote sensing and weed science qualified him for the position, according to Kevin Dalsted, acting director of the Engineering Resource Center at SDSU, associate director of the Consortium and Broulik’s project supervisor.

“We’re entering a new phase as we relate remote sensing to agriculture,” Dalsted said. “Brian was doing research in that field already and had a weed science background, so he was a perfect candidate for the assistantship.”

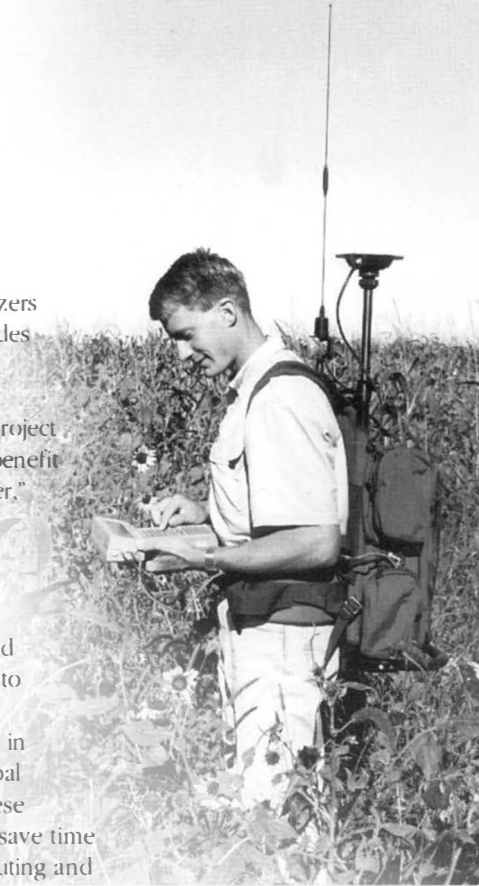
Broulik is conducting similar research for his master’s degree, which he hopes to complete in December 1998. Much of his work for the Consortium project will involve analyzing satellite and aerial imagery in an effort to identify areas of nutrient deficiency, insect problems, and weed populations in fields. The images will be used to show the exact size, location, and density of problem areas within a field. Ultimately, such information will help agricultural producers

apply fertilizers and herbicides only where required.

“This project will really benefit the producer,” Broulik said. “With increased input costs, farmers need every edge to remain competitive in today’s global market. These techniques save time in field scouting and provide more precise information regarding problem areas in fields. They allow producers to make more precise applications of fertilizer and pesticides and to apply only what’s needed, causing less environmental stress. It makes sense agronomically, economically and socially.”

Through the project, Broulik hopes to learn more about image processing technology and to become more familiar with software in data manipulation. But his ultimate goal is to apply what he learns to help improve farm management practices.

“The most important part of this for me is to be able to apply aerial images agronomically, and to work with weed scientists, entomologists and other agronomists in developing better farm management programs,” he said.



Lecture series
advances
mission

of Center of Excellence

When SDSU's Center of Excellence in Engineering Technology was established in 1996 by the South Dakota Board of Regents, it took on the challenge of promoting continued growth in technology throughout South Dakota.

The latest step toward realizing that goal is a series of four lectures and discussion panels on technological topics. The Center of Excellence in Engineering Technology Lecture Series, kicked off by Chicago-area businessman Harry Moser this fall, is designed to heighten awareness of current technology issues in both industry and academe, so that the two entities may work together in training tomorrow's professional technologists.

Collaboration between industrialists and educators has been a focus of the Center of Excellence since its inception, said Duane Sander, dean of the College of Engineering. In fact, the three

programs encompassed by the center—electronics engineering technology, construction management, and manufacturing engineering technology—were created largely in response to needs identified by state and regional industries.

"The industries in the state, as well as those looking at expanding or moving into the state, are in need of technologically-trained people who have management abilities and can really enhance and support them in their production areas," Sander said. "An overall goal of our Center of Excellence is to provide those kinds of people to industries in the region."

That goal goes hand-in-hand with the College of Engineering's focus on providing quality engineering education through the practical integration and application of engineering, science, and technology principles, thereby producing quality graduates. The lecture series can help meet that goal by gathering input from various spokespersons not only on what kind of graduates industry needs, but also on what kind of education students need, said Carrie Mattson, instructor and coordinator of the Manufacturing Engineering Technology program.

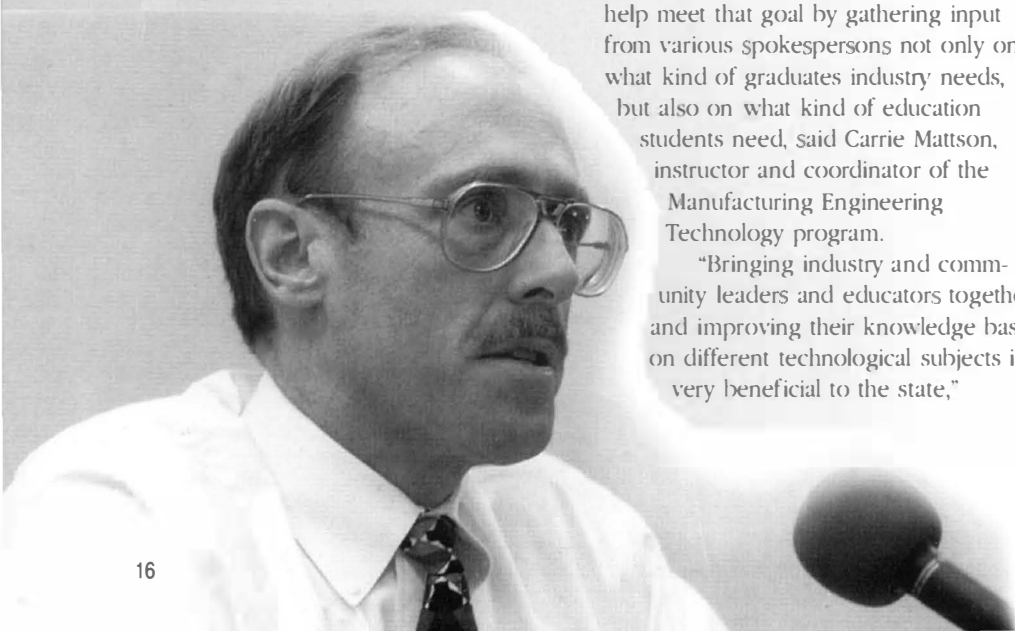
"Bringing industry and community leaders and educators together and improving their knowledge base on different technological subjects is very beneficial to the state,"

Mattson said. "Our goal is to have a Center of Excellence that promotes the interests of technology throughout the state. I hope it will improve the visibility of technology issues and improve the visibility of our programs, as well."

The first lecture in the Center of Excellence series definitely spotlighted one South Dakota problem, Mattson said. Harry Moser, president of Charmilles Technologies Corporation in the Chicago area, discussed South Dakota's extreme shortage of skilled tool and die workers, who make the tools, molds, and other devices used in manufacturing. Moser, who works nationally to attract more of America's youth into the manufacturing trade, said the shortage forces local industry to send many tooling orders, and the millions of dollars of sales and payroll that come with them, out of the state and country.

"There is such a shortage of people that tools and dies are being made in Southeast Asia, and therefore, the work is lost to the U.S.," Moser said. "If you develop the capability to do the work, the work will come to shops in South Dakota. There are entrepreneurs who will buy equipment, hire people, and set up shop if they can find the people."

Brookings businessman Jerry Luetzow joined Moser and three other panelists for a discussion following the lecture. As proof of the shortage of tool and die workers, Luetzow described the situation at his own company, MTR Inc., which employs sixty people. "It takes two tool and die makers to support those sixty people," he said. "If I don't have



Engineering's first Job Fair

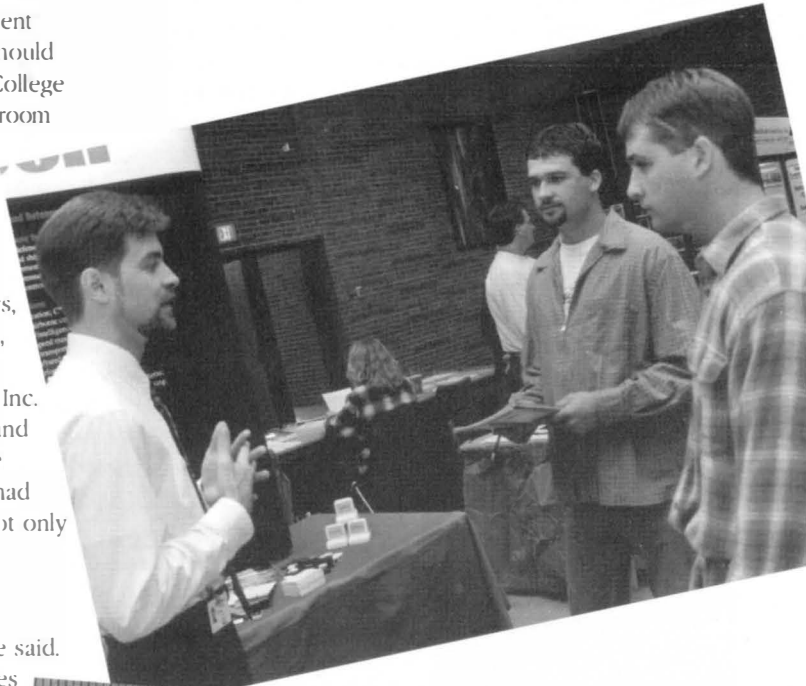
If you're a South Dakota State University engineering student searching for a full-time job or summer internship, you should have grabbed your resumé and headed to the first-ever College of Engineering Job Fair held October 23 in the Volstorff Ballroom in the University Student Union.

Sponsored by the Joint Engineering Council (JEC), the exposition featured representatives from more than twenty local, state, and regional companies. Among the firms who appeared at the fair were EROS Data Center/Hughes STX Corp., Gateway 2000, Howard R. Green Consulting Engineers, Horton Vehicle Components, Martin and Associates, Midcom, Raven Industries, Rockwell Avionics and Communications, Rosco Manufacturing, Special Teams and Stanley Consulting Inc.

According to Matt Asche, a senior engineering student and JEC president, all of the companies attending had immediate openings for full-time and summer employment, and some had up to 100 jobs available. He said the Engineering Job Fair not only gave students a chance to job hunt, it also allowed them to become more familiar with area industry.

"Most of these companies have immediate openings for engineers, and many will have internships available, too," he said. "It's a really good opportunity to learn more about companies in the area."

For more information about the next Engineering Job Fair scheduled for October 22, contact the College of Engineering at (605) 688-4161.



Unique *fiber optics* lab in development

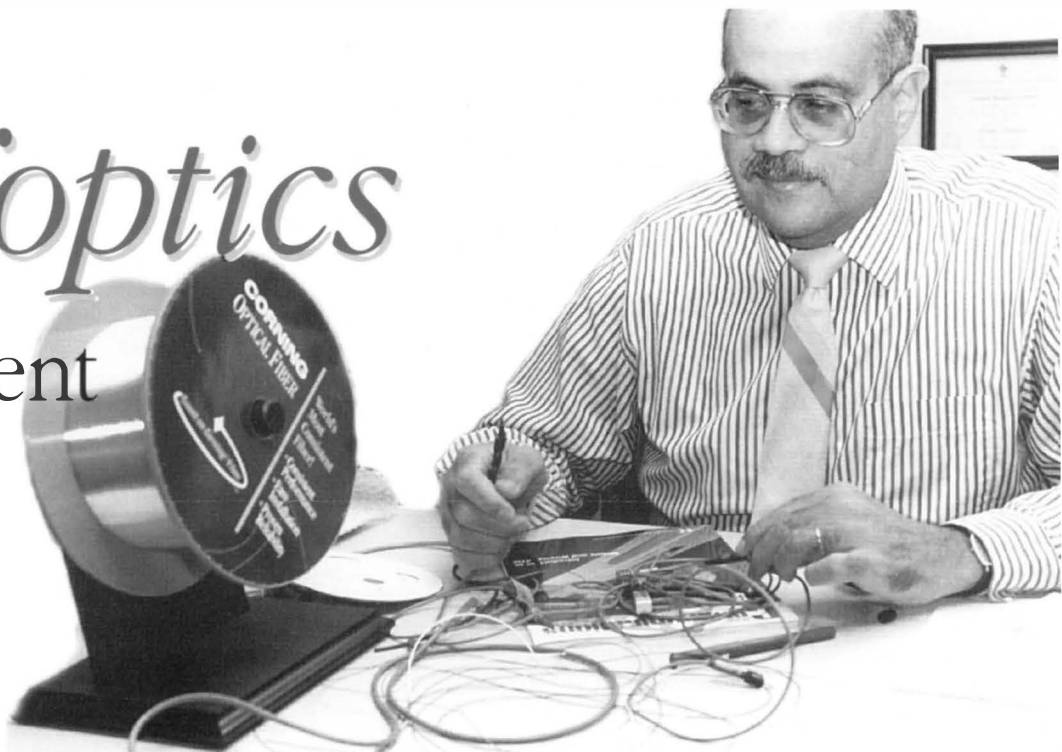
Fiber optic cable is the wave of the future for communications, and SDSU wants to prepare its students to ride that wave.

Alfred Andrawis, associate professor of electrical engineering, has received a National Science Foundation (NSF) grant which will help do just that. The \$50,000 grant, along with \$66,000 in matching funds from SDSU, will equip a fiber optics laboratory on campus.

Currently, Andrawis teaches an elective course in fiber optics for electrical engineering majors, and an optics course is offered for physics students. However, neither course includes a laboratory section, which Andrawis feels is essential.

"Fiber optics technology is getting to be a major technology in communications. Almost all communications in the United States is over fiber," Andrawis said. "Right now, most of our students do not get any hands-on experience, which is needed to reinforce the theoretical concepts. The most recent model for optimization of learning suggests that student interest, involvement, and retention are greatest for material studied in a practical framework with hands-on experience. Hence, a hands-on approach to fiber optics is essential to keep students at the cutting edge of this emerging technology."

The NSF grant will provide basic lab equipment, including optical tables, optical power and wavelength measurement equipment, and optical components. Meanwhile, Andrawis will continue to look into other avenues to create the best-equipped laboratory possible.



"Even the money we're getting from the National Science Foundation with matching money from SDSU will not be enough to do everything we want to do," he said. "I'm working with vendors of fiber optics equipment to get donations and small grants. Hopefully, it will produce a very good, state-of-the-art lab."

The laboratory will be used for undergraduate instruction and research in the areas of electrical engineering, engineering physics, and electronics engineering technology, Andrawis said. "This lab will have a serious impact on the quality of instruction in the areas of fiber optics communications and sensing in all three departments simultaneously," he said.

After five years of teaching an introductory fiber optics course at SDSU, Andrawis plans to introduce a more advanced course into the curriculum next year. He sees increasing interest among both students and potential employers. Recently, US West contacted SDSU looking for engineers and technologists to fill some of their 400 communications openings. That is just one example, Andrawis said, of the demand for employees with fiber optics backgrounds.

"Expanding our offerings will not only make our graduates more marketable for jobs, but it will intrigue our students' interest in the new field and maybe

encourage them to pursue careers in communications, which is a hot field right now," he said.

The need for fiber optics education is not limited to the university level. Andrawis is applying for additional funding through NSF, along with local grants, to conduct a three-year series of summer workshops to train high school and technical institute teachers in fiber optics technology. If the equipment is available, he said, the workshops could start next summer, with separate sessions for high school and technical institute teachers.

"We'll give them the background knowledge to introduce the technology to their students, which in turn will intrigue the students toward science, technology, and engineering," Andrawis said.

The need for people educated in fiber optics will continue to grow, Andrawis said, as the communications technology becomes increasingly important to the state and region.

"Recently, the state of South Dakota recognized the importance of communications," he said. "Therefore, it is essential for South Dakota State University, the largest higher education institution in the state, to be equipped to educate interested individuals with the cutting-edge techniques of fiber optics technology."

ERC

reaches thousands

In an effort to provide a more intensive focus on the outreach function of the College of Engineering, the Engineering and Environmental Research Center (EERC) at South Dakota State University has become the Engineering Resource Center (ERC). The change, which is effective immediately, was approved by the South Dakota Board of Regents in December.

The restructuring, which will separate the College's outreach and research efforts, says Duane Sander, Dean of the College, will provide more focus for each field.

"The ERC will now more closely represent the outreach services provided through the College," he said, "and we have established a separate directorship to concentrate on research."

ERC programs are directed primarily toward manufacturers, entrepreneurs, and people involved in service and retail businesses. Comprised of Engineering Extension, The University Industry Technology Service (UITS), the Manufacturing Extension Program (MEP), the

Entre Program, the Space Grant Consortium, the Local Transportation Assistance Program (LTAP), and the Office of Remote Sensing, the ERC's outreach efforts touch the lives of thousands of people annually.

"Our primary function will be outreach," said Kevin Dalsted, acting director of the ERC. "The majority of our staff is directed toward outreach, and it has been headed in that direction for the last few years."

The research component of the former EERC, now its own entity—Engineering Research—is under the direction of Dennis Helder, former EERC director. An associate professor in the College, Helder returned to the Department of Electrical Engineering at the beginning of fall semester. He also will devote a portion of his time to the overall coordination of research within the College of Engineering.

The search for a director of the ERC is currently underway. Dalsted expects a candidate to be chosen in January.

Please Take note

Beginning May 15, 1998, all employment referral files maintained at the Career and Academic Planning (CAP) Center that have not been used or updated in the past ten years will be destroyed. This will not include University transcripts, which are maintained indefinitely at the Records office.

If you have a file scheduled for discard, you may submit a written request to the CAP Center, Box 511, SDSU, Brookings, SD 57007, and your file will be maintained indefinitely. Before older files that are retained can be sent to prospective employers, an update will be required.

This discarding process will continue on an annual basis without further notice. Because of the confidential nature of the files, it is not possible for the files to be returned to individuals.

Alumni are welcomed and encouraged to re-establish a file and to use any of the services provided by the CAP Center.

If you have questions or concerns, please contact the CAP Center, Box 511, SDSU, Brookings, SD 57007, or call 605-688-4153.

Brown

named to IEEE post for 1998

Lewis Brown, associate professor and head of the Electrical Engineering Department, has been named vice chair of the Medical Ultrasonics Group and appointed to the Technical Program Committee for the 1998 IEEE Ultrasonics Symposium.

IEEE (Institute of Electrical and Electronics Engineers) is the largest international professional society in the world. Broken down into thirty-eight societies, IEEE represents all the major subdivisions of electrical engineering. Brown's society focuses on ultrasonics, primarily in the medical field. Most of the research involves the development of new medical technology and improved patient services provided by medical equipment. For example, experiments are being done to improve the equipment used for pregnancy ultrasounds and better graphics for the images developed during ultrasounds.

As vice chair of his group, Brown is responsible for reviewing about 250 abstracts (one-page explanations of a scientist's study and presentation ideas) submitted each spring. Together, Brown and twenty leading scientists located all over the world review about 600 abstracts each year. Brown must decide which abstracts present the newest and most significant research material.

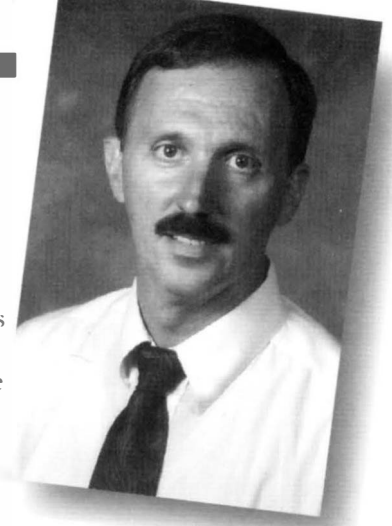
Between twenty-five and thirty percent of the abstracts submitted are rejected each year, so it's important that the committee members are top experts in their field to properly explain each rejection. Approved abstracts are invited to the annual international conference, set for Japan next year and expected to draw more than 1,000 attendees.

This will be Brown's second year as vice chair and his sixth year on the Technical Program Committee, positions he thoroughly enjoys and hopes to continue for a long time. "It's a very fun way for me to have professional interactions with leaders in this field from all over the world," he said. "I not only make new friends everywhere I go, I also get to

review a number of papers that are published in very prestigious journals."

Involvement in the IEEE is a great way for SDSU to gain national recognition, Brown said. "It really puts SDSU on the map in the world of ultrasonics and electronic materials at the international level," he said. "It says a lot about our program and shows that we're not just a small institution on the prairie, but that we are making significant contributions to world science here at SDSU."

Brown is also an associate editor for the *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, a leading scientific journal in the area of ultrasonics.



New video demonstrates SNOW removal

Though you won't find it on the shelf at your local video store, the newest release from the Local Transportation Assistance Program (LTAP) at SDSU, is a must-have item for motorgrader operators preparing for the winter season.

"Snow Removal Applications for Motorgraders," a 21-minute video released in November, demonstrates the proper use of the machine for snow removal from rural roads. It includes tips on operating and maintaining the machine, removing snow on different types of road surfaces, as well as V-plow and winging techniques.

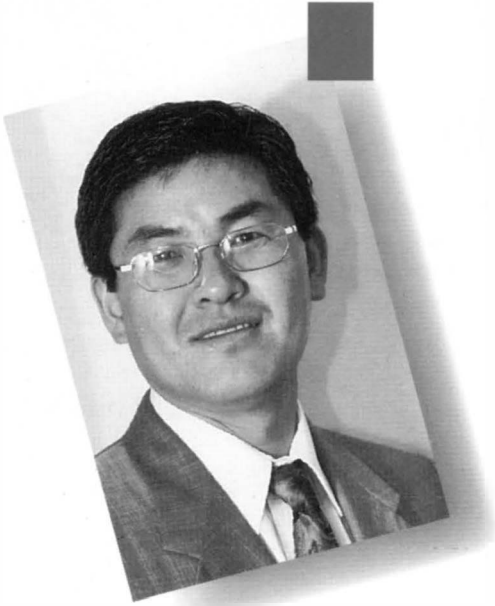
Ken Skorseth, field operations manager for LTAP, which is part of the Engineering Resource Center (ERC) at SDSU, developed the video. The concept for the instructional tape, he says, surfaced three years ago. "The idea came to me from local highway workers," he said. "They were contacting me because they were in need of training—specifically on motorgraders."

To satisfy the immediate need, Skorseth first developed a short procedure manual containing written instruction, as well as photos and illustrations. He was overwhelmed by the number of requests to reprint the handbook. "LTAP Centers in surrounding states reprinted the manual in full or in part, and the United States Federal Highway Administration reprinted it and distributed it to northern states," Skorseth said. "It has been reprinted so many times we've lost track, but there are at least 15,000 circulating around the country."

Skorseth says he expects the video, which is based on the manual, to be equally well-received, thanks in part to last year's history-making winter. "The winter of 1996-97 was so difficult that there was a great need for proper training," he said. "I think the video will be popular in helping highway departments prepare for similar seasons in the future."

Funding for the video was provided by Caterpillar, Inc. of Peoria, Illinois, and the Balderson Co. of Wamego, Kansas, which makes attachments for Caterpillar equipment. Skorseth and three county highway superintendents wrote the script for the tape. "All of the work for the video was in addition to my usual duties with LTAP and ERC," Skorseth said. "It was hard to find time to do it, but it feels good knowing that we put something together that so many people need."

For more information on "Snow Removal Applications for Motorgraders," contact Skorseth at (605) 688-5601, or contact any Caterpillar dealer and ask for training tape #TEVN3977.



Shin

visits Korea,
earns award,
during busy
summer
vacation

For most people, a visit back home means rest and relaxation. But that wasn't the case for Sung Yun Shin, who spent part of his summer in Korea.

Shin, an associate professor of computer science, toured his home country for a month, giving presentations regarding parallel systems/distributed systems for modeling and simulating atmospheric point spread function, a three-year NSF/EPSCoR project that he is working on with SDSU associate professors Dennis Helder and Stephen Schiller. Shin departed Brookings May 18 and returned June 16.

During his visit, Shin was invited to give seven presentations to various companies and universities. Among the companies were Samsung Electronics, the largest manufacturer of memory chips in the world, and the Korean Electronics and Telecommunications Research Institute, a government sponsored research organization with an annual budget of more than \$350 million.

Shin experienced his largest audience, consisting primarily of computer programmers, at the Republic of Korea's Air Force Headquarters. "I spoke about geographical information systems at the Air Force's computer center," he said. "I was surprised because almost 400 people attended. I think most of them were there to expand their interest."

Shin also visited and lectured at Pohang University of Science and Technology, Korea's equivalent of MIT; Chungnam University, SDSU's sister university; Dongkuk University; and Kongju National University.

This wasn't Shin's first trip back to Korea. He has returned every year but one since 1990, and has presented one or two papers during each visit.

Shin feels those previous visits abroad, as well as the most recent, were beneficial because they allowed him to share information and discover future funding sources. As important, he said, is the recognition brought to SDSU.

"It was a good opportunity to exchange information and discuss possible research funding," Shin said. "It was also a nice way to advertise our University and recognize our program, because most people didn't know about South Dakota State University."

Shin has also brought recognition to SDSU through his involvement with the Association of Management and the International Association of Management (AOM/IAOM). At this year's international convention in Montreal, Canada, in August, Shin received an award for meritorious service. The honor acknowledges his roles as chair of the computer science division and editor of the computer science version of the organization's proceedings. Shin will also serve as editor of the *International Journal of Computer Science and Information Management*, a new publication for the AOM/IAOM.

Shin joined the SDSU faculty in 1991. He earned a bachelor's degree from Chung-Ang University in Seoul, Korea before enrolling at Kentucky State University, where he received a second bachelor's degree in 1984. He earned his master's in 1986 and his doctorate in 1991, both from the University of Wyoming.

Burckhard

conducts research at

EROS



burn it. But burning and chemical treatment kills the soil, and all of these are expensive treatments," she said. "With phytoremediation, you don't remove the soil, you treat it with vegetation suitable to the contamination and the soil. The vegetation treats the petroleum as a food source, degrading it. When it's done, the soil is still soil. It's less expensive and less intrusive."

Planting appropriate vegetation in contaminated soil is a proven method of cleanup, though expensive in more remote areas. Dr. Suzette Burckhard, assistant professor in the Department of Civil and Environmental Engineering, is searching for a solution to that problem.

Burckhard is participating in the Faculty Research Program sponsored by the South Dakota Space Grant Consortium. The objectives of the program are to engage faculty members in the research programs at the EROS Data Center (EDC), to establish continuing relationships between faculty members and their professional peers at EDC, and to enhance research interests and capabilities of science and engineering faculty members. Burckhard is hoping to develop a more cost-effective way to apply phytoremediation techniques in remote areas.

Phytoremediation is the use of vegetation to remediate or stabilize a contaminated soil. According to Burckhard, vegetation planted in petroleum, organic chemical and/or heavy metal contaminated soils, cleans up or stabilizes the site.

"In soils contaminated with petroleum or hydrocarbons, studies have shown that without vegetation, the microbial populations cannot degrade all of the contaminant that is present," she said. "By introducing plants to the system, microbes have a region around the plant roots where they can thrive and the contaminants can diffuse in at lower, less toxic concentrations, allowing more of the contaminant to be degraded."

Burckhard says that there are different options available when it comes to cleaning up contamination. But phytoremediation is a more natural method that helps the earth cleanse itself.

"There are several ways to clean up a gasoline spill, for instance. You can dig it up and send the soil to the landfill. You can treat it with chemicals. You can

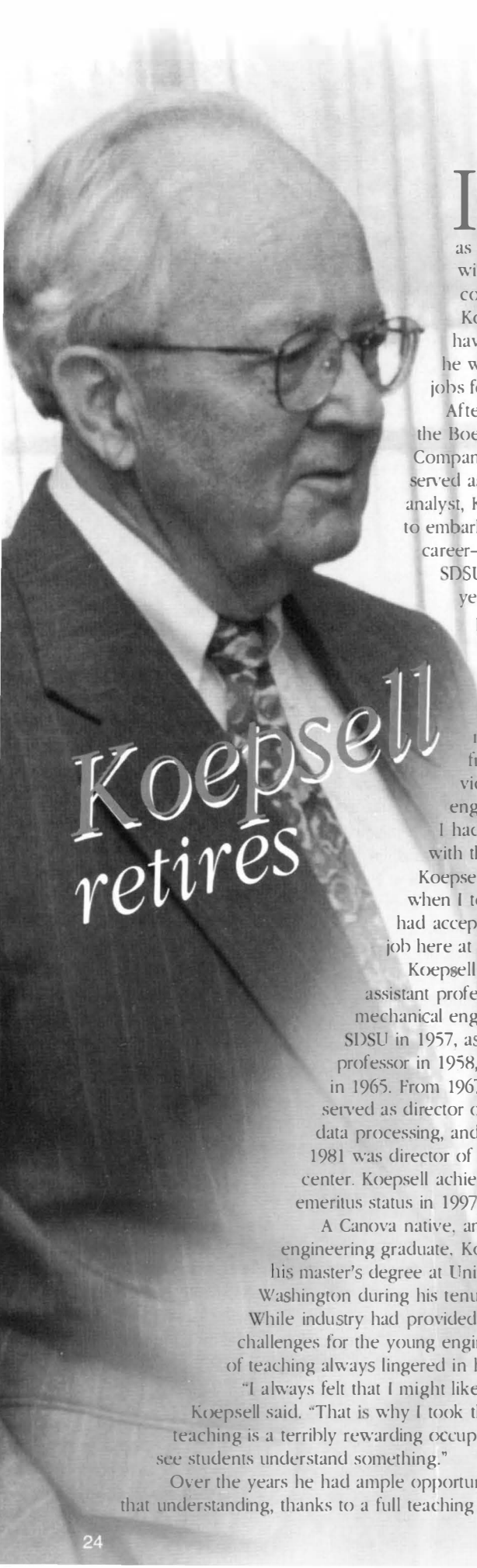
Less expensive, that is, when the site isn't too far away. In order to assess the success of a phytoremediation project, the health of the plants and the movement of the contaminant need to be evaluated. Plants are harvested at intervals and analyzed for greenness, biomass, overall appearance, and chemical analysis of the biomass for contaminant uptake. For remote field sites, the cost involved in assessing these parameters become prohibitive, especially for large sites where more sampling may be necessary.

This is where Burckhard's EROS research comes into play. She is hoping to prove the cost effectiveness of remote sensing in phytoremediation. Remote sensing techniques, which include the use of aerial and satellite photographs, are often used in the agricultural industry to assess the growth of different crop varieties, and have used similar parameters as those required in a phytoremediation project. Burckhard feels fortunate to have access to EDC's remote sensing data for her research.

"It is really the perfect place for this research," Burckhard said. "EROS has available aerial and satellite photos which can provide information related to the health of vegetation, and help assess if phytoremediation will work."

Remote sensing would eliminate much of the physical checking, saving time and expense on distant sites. It would reduce analytical costs, while making it possible to work with larger sites.

Burckhard will present her results on campus in early 1998 and again in May at the annual meeting of the Environmental Protection Agency's Regions 7 and 8 Great Plains/Rocky Mountains Hazardous Substance Research Center.



Koepsell retires

In 1957 when he left behind a promising future as an engineer with a Seattle company, Paul Koepsell may not have realized that he was changing jobs for the last time.

After five years with the Boeing Air Plane Company, where he served as a structural analyst, Koepsell decided to embark on a new career—teaching at SDSU. Now, forty years later, he is preparing for the adventure of retirement.

“On the day I received my five-year pin from Boeing, the vice president of engineering told me I had a great future with the company,” Koepsell said. “That’s when I told him that I had accepted a teaching job here at SDSU.”

Koepsell was named an assistant professor of mechanical engineering at SDSU in 1957, associate professor in 1958, and professor in 1965. From 1967 to 1976 he served as director of research and data processing, and from 1975 to 1981 was director of the computing center. Koepsell achieved professor emeritus status in 1997.

A Canova native, and 1952 SDSU engineering graduate, Koepsell earned his master’s degree at University of Washington during his tenure at Boeing. While industry had provided numerous challenges for the young engineer, thoughts of teaching always lingered in his mind.

“I always felt that I might like teaching,” Koepsell said. “That is why I took this job. I think teaching is a terribly rewarding occupation. It’s fun to see students understand something.”

Over the years he had ample opportunity to witness that understanding, thanks to a full teaching load that

sometimes put him in charge of as many as six courses in one term. But teaching that many classes never posed a problem for him. There was one thing, though, that he says proved more challenging with each passing year.

“There is one drawback to teaching, and that is grading papers. Correct answers are important, but in a timed exam I’m more interested in grading on how a student worked the problem. I also feel obligated to make comments. That’s a lot more helpful to the students than a check mark,” Koepsell said. “When I started, I would give a quiz in class, and immediately go to my office and correct them. But as the years have gone on, it gets harder. I drag my feet, and find any excuse to put it off. Though I do try to get things handed back in a timely manner.”

Along with the challenges that accompany forty years of college-level instruction, Koepsell has witnessed his share of changes within the College of Engineering and the University, as well. One of the most notable, he says, was the introduction of computers and technology.

“The technology in teaching, such as RDTN and computer-based instruction, is amazing. But they are no substitute for one-on-one interaction,” he said. “If you can sit down with students and see them work on a problem, and see what is troubling them, that makes a difference.”

That interaction, he admits, will be one of the most difficult parts of his job to leave behind. “I’m going to miss teaching. Of all the things I’ll miss, I’ll miss that the most,” he said. “One thing about it is that you work on a rigid schedule. Your day is planned as soon as it starts. Free, unplanned days might present a problem for me at first.”

But Koepsell won’t have to give up teaching cold turkey. He will have the opportunity to ease out of the profession by teaching a course once each week in Sioux Falls, during the spring semester. After that, he will concentrate on other interests with his wife, Delores, who retired as a registered nurse in May.

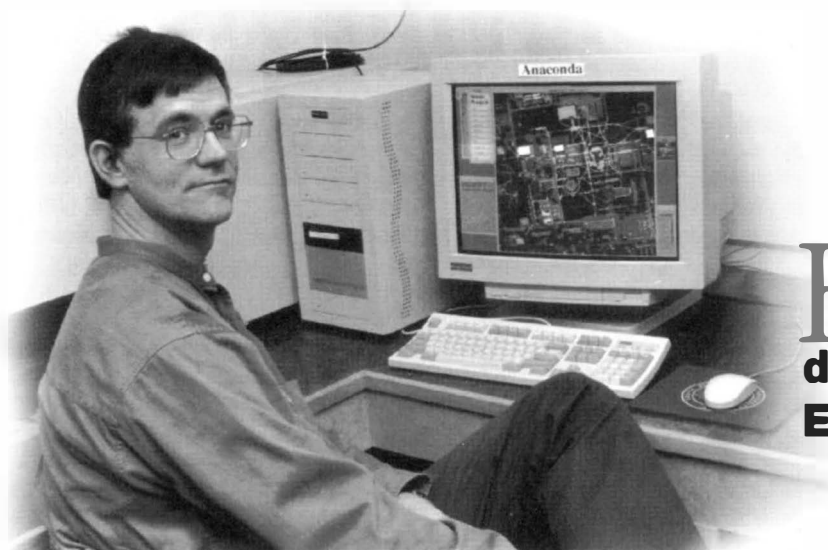
“We plan to do some remodeling and some traveling. We’re putting a two-room addition on our house, with a basement under it where I’d like to build a model train display,” he said. “My wife and I are consummate train riders. We’ve traveled by train in Europe, China, Australia, and the United States, and now I’m trying to arrange a train trip from Vladivostok to Moscow.”

No matter how far he travels from Brookings, Koepsell will take with him many fond memories of SDSU. One of his most cherished, is also one of his earliest.

“One of my greatest memories is of the very first class I ever taught. They were a remarkable group, and unusually talented,” he said. “I never worked so hard in my life, just keeping them busy. That was a challenging way to begin my teaching career.”

Perhaps one of the most rewarding aspects of his career is talking with his students after they graduate. Something he hopes will continue.

“I’ve crossed paths with many of my students over the years, several times in airports. Once they tell me their name, I can remember them, and the class they took from me,” he said. “It is always a nice surprise.”



Helder

directs
Engineering Research

In the past ten years, the College of Engineering's research funding has increased nearly twenty-fold. To contend with that growth, a veteran faculty member has been appointed to oversee the administrative management of the College's research efforts.

Dennis Helder, associate professor in the Department of Electrical Engineering, is now also the director of Engineering Research. The main objective of his position, he says, is to provide a research infrastructure for faculty members.

"My duties are to coordinate research, develop research, and support it," he said. "By support, I mean provide tools, insight, and direction necessary for faculty members to take their expertise and develop it into productive research."

Helder, who will continue teaching in the College, said he will also assist faculty members in clearing hurdles that accompany grant applications, proposal writing, and the university system.

These duties, however, aren't new to Helder. He also performed them during three years that he served as director of the Engineering and Environmental Research Center (EERC). The increase in research activities, and the commitment by Helder to five of his own research projects, convinced administrators to split the EERC responsibilities into two separate jobs. Helder's new position is not part of the EERC, which has since been restructured as the Engineering Resource Center (ERC).

A faculty member since 1985, Helder credits the increase in research and its funding to strong leadership within the College. "Dean Buckley had a vision to develop more research within the College of Engineering," Helder said, "and Dean Sander has carried that out."

According to Helder, Buckley and Sander encouraged young faculty members to finish their doctoral degrees and return to SDSU. They came back, Helder says, excited about research.

"Doctoral research offers people the opportunity to discover new things and solve problems, and persuades them to continue doing it," he said. "As a result, in the last ten years research funding has gone from less than \$100,000 per year, to nearly \$2 million."

Helder's projects alone account for more than \$100,000 of the College's annual research funding. He is currently developing methods for removing radiometric errors from aerial and satellite imagery, and is helping create an aircraft fuel that is purely alcohol.

Born in Sioux City, Iowa, Helder grew up outside of Canton. He received three degrees from SDSU, including a bachelor of science in animal science in 1979, a bachelor of science in electrical engineering in 1980, and a master of science in engineering in 1985. He earned his doctorate in engineering from North Dakota State University in 1991.

An avid small aircraft pilot, Helder resides near DeSmet with his wife, Susan,

and their children, Virginia, Benjamin, Camden, Lara, and Ethan.

■ Around Campus

Larry Browning recently participated in a National Science Foundation Chautauqua course, "Using New Technologies for Teaching Introductory Astronomy," at the College of St. Catherine in St. Paul. The course was designed help college faculty strengthen their content and delivery of an introductory astronomy course using the newest technologies available. Participants used the Internet as a source of content material and laboratory data image analysis. Browning, an associate professor, teaches astronomy and physics.

Alfred Andrawis was awarded the IEEE Outstanding Branch Counselor and Advisor Award for 1997. Up to ten such awards may be given each year to more than 900 Branch Counselors and over 200 Branch Chapter Advisors throughout the world. Andrawis is an associate professor in the Department of Electrical Engineering.

■ Faculty

New faculty, assignments



Name: Ross Abraham

Appointment: Assistant professor of mathematics

Professional Emphasis Area: Abstract algebra

Educational Background: Bachelor's degree in mathematics and computer science, Augustana College, 1990; Master's degree in mathematics, the University of Montana, 1993; Doctor's degree in mathematics, the University of Houston, 1997.

Personal Notes: Originally from Alcester, South Dakota, Abraham lives in Brookings with his wife, Julie. Interests include singing and playing chess, running and bike riding.



Name: Suzette Burckhard

Appointment: Assistant professor of civil and environmental engineering

Professional Emphasis Area: Contaminate transport, water resources, and hydrologic processes

Educational Background: Bachelor's degree in engineering physics, South Dakota State University, 1986; Master's degree in physics, Kansas State University, 1992; Master's degree in chemical engineering, Kansas State University, 1993; Doctor's degree in civil engineering, Kansas State University, 1997.

Personal Notes: Burckhard grew up in Brookings and graduated from Huron High School. She lives in Brookings with her husband, Tim, and son, Jakob, born last February.



Name: Kurt Cogswell

Appointment: Assistant professor

Professional Emphasis Area: Dynamical systems in mathematics

Educational Background: Bachelor's degree in physics, the Massachusetts Institute of Technology, 1978; Master's degree in mathematics, North Dakota State University, 1991; Doctor's degree

in mathematics, Northwestern University, 1986.

Personal Notes: An Aberdeen native, Cogswell enjoys bike riding and playing the bass trombone.



Name: Pat Emmons

Appointment: Assistant professor, civil and environmental engineering

Professional Emphasis Area: Hydrology and ground water

Educational Background: Bachelor's degree in mathematics and physics, Winona State University, 1968; Master's degree in geology, Northern Arizona University, 1975.

Personal Notes: After an early retirement from the federal government, Emmons moved to Dell Rapids with his wife, Pat. They have two daughters, Jennifer and Susan. Spare time interests include hunting, fishing, and woodworking.



Name: Wayne Haug

Appointment: Part-time instructor in Construction Management Program

Professional Emphasis Area: Blue print reading and construction surveying

Educational Background: Bachelor's degree in civil engineering, SDSU, 1968; Master's degree in civil engineering, SDSU, 1969.

Personal Notes: Originally from Brandt, South Dakota, Haug and his wife, Karla, live in Brookings with their two daughters, Kathy and Karleen. Interests include hunting and attending SDSU's sports events.



Name: Richard Kelley

Appointment: Assistant professor of physics

Professional Emphasis Area: Remote sensing and instrumentation

Educational Background: Bachelor's degree in mathematics, Lehigh University, 1968; Bachelor's degree in electrical engineering, Lehigh University, 1969; Master's degree in physics, Sam Houston State University, 1978; Doctor's degree in physics, Colorado State University, 1984.

Personal Notes: The Harrisburg, Pennsylvania, native lives in Brookings, while his wife, Angela Petersen-Kelley,

currently lives in Rapid City with their children, Patrick and Brianna. Kelley's interests include working with the Catholic Campus Parish Council, hiking, traveling, walking, biking, and learning new computer application software.



Name: Kasiviswanath Muthukumarappan

Appointment: Assistant professor of agricultural engineering

Professional Emphasis Area: Food and biomaterial engineering

Educational Background: Bachelor's degree in mathematics, India, 1981; Bachelor's degree in agricultural engineering, India, 1985; Master's degree in food engineering, Thailand, 1988; Doctor's degree in agricultural engineering, University of Wisconsin, 1993.

Personal Notes: Kasiviswanath, who was born in India, lives in Brookings with his wife, Eswari, and their seven-year-old daughter, Arthy. He enjoys reading, playing tennis, and traveling during his spare time.

Name: Brian Ludens

Appointment: Fabrication technician in electrical engineering

Professional Emphasis Area: Electronics

Educational Background: Currently working toward his bachelor's degree in electronic engineering. Has attended the University of South Dakota in Springfield, South Dakota, Southwest State University, and SDSU.

Personal Notes: A Springfield, South Dakota, native, Ludens lives in Brookings with his wife, Kim, and his two daughters, four-year-old Mary and one-year-old Stephanie.

Name: Carrie Mattson

Appointment: Coordinator of MET Program and the Center of Excellence Lecture series

Professional Emphasis Area: MET Program (Manufacturing Engineering Technology), focuses on broad subject of practical manufacturing

Educational Background: Bachelor's degree in metallurgical engineering, Michigan Technological University, 1990; Master's degree in industrial engineering

From top:

Recayi Pecen

Chuck Pawloski

Wayne Haug

Alex Moutsoglou

Kasiviswanath Muthukumarappan

technology with an emphasis in industrial management and technology, Central Michigan University, 1993.

Personal Notes: After seven years as an advanced development engineer at Hitachi Magnetics Corp. in Edmore, Michigan, Mattson moved to Brookings with her cat, Portia. Other interests include an antique silver collection, reading, and art.

Name: Alex Moutsoglou

Appointment: Professor of mechanical engineering

Professional Emphasis Area: Thermofluid science

Educational Background: Bachelor's degree in mechanical engineering, 1973; Master's degree in mechanical engineering, 1974; Doctor's degree in mechanical engineering, 1977, all from the University of Missouri-Rolla.

Personal Notes: After spending a year in his native Greece, Moutsoglou has returned to SDSU. He and his wife, Joyce, have four daughters, Daphne, age eleven, Maria, age ten, Nefeli, age seven, and Lena, age two. Spare time interests include reading and driving his daughters to numerous dance and instrumental music rehearsals.

Name: Oren Quist

Appointment: Department head, physics

Professional Emphasis Area: All physics areas, including solid state physics

Educational Background: Bachelor's degree in physics and mathematics, Gustavus Adolphus College, 1965; Master's degree in physics, University of Denver, 1967; Doctor's degree in physics, University of Denver, 1973.

Personal Notes: Born in St. Peter, Minnesota, Quist has been at SDSU for twelve years. He lives in Brookings with his wife, Karen, and they have two sons, Scot and Eric. Woodworking, hiking, walking, fishing and hunting are some of his outside interests.

Name: Charles Pawloski

Appointment: Electrical engineering instructor

Professional Emphasis Area: Power systems in electrical engineering

Educational Background: Bachelor's degree in electrical engineering, Michigan Tech, 1990; Bachelor's degree in engineering administration, Michigan Tech, 1990; Master's degree in electrical engineering, Iowa State University, 1993; working on finishing doctorate degree, Iowa

State University, anticipated graduation, May 1998.

Personal Notes: Pawloski lives in Brookings while his wife, Janice, lives in Michigan with their two children, five-year-old Luke and eighteen-month-old Kristen. During his spare time he enjoys golfing.

Name: Recayi Pecen

Appointment: Electrical engineering instructor

Professional Emphasis Area: Electrical power systems, electrical machinery, applications of signals and systems and state estimation.

Educational Background: Bachelor's degree in electrical engineering, Istanbul Technical University, 1986; Master's degree in control and computer engineering, Istanbul Technical University, 1990; Master's degree in electrical engineering, University of Colorado, 1993; Doctor's degree in electrical engineering, University of Wyoming, 1997.

Personal Notes: Pecen, originally from Istanbul, Turkey, and his wife, Oznur, have two sons, four-year-old Furkan and Fatih, who was born September 4. Spare time interests include fishing and swimming.

Name: John Reposa

Appointment: Associate professor, construction management

Professional Emphasis Area: Construction estimating, project/construction safety

Educational Background: Bachelor's degree in engineering, Roger Williams College, 1974; Bachelor's degree in civil and environmental engineering, University of Rhode Island, 1981; Master's degree in civil engineering with an emphasis in construction management, Florida Institute of Technology, 1989; Doctor's degree in civil engineering and water resources, Florida Institute of Technology, 1996.

Personal Notes: Originally from Newport, Rhode Island, Reposa is an avid bicyclist and also enjoys step aerobics and downhill skiing.

Name: Dan Schaal

Appointment: Assistant professor of mathematics

Professional Emphasis Area: Combinatorics (discrete mathematics)

Educational Background: Bachelor's degree in chemistry and physics, SDSU, 1982; Master's degree in mathematics, SDSU, 1988; Doctor's degree in mathematics, University of Idaho, 1994.

Personal Notes: Born in Bridgewater, South Dakota, Schaal and his wife, Madeline, have an eight-month-old son, Isaac. Spare time activities include hunting and fishing.

Name: Harvey Svec

Appointment: Permanent faculty, MET Program, instructor

Professional Emphasis Area: MET Program (Manufacturing Engineering Technology), engineering graphics

Educational Background: Bachelor's degree in industrial arts education, SDSU, 1968; Master's degree in education, SDSU, 1974.

Personal Notes: Employed at SDSU for four years on emergency hire, Svec lives near Brookings with his wife, Harriet, and their two high school sons, Adam, a senior, and Joe, a junior. Recently Svec and his brother restored their grandfather's antique tractor.

Name: Tim Wittig

Appointment: Assistant professor, statistics and mathematics

Professional Emphasis Area: Statistician, statistical consulting, and teaching

Educational Background: Bachelor's degree in mathematics, SDSU, 1976; Master's degree in statistics, Michigan State University, 1978; Doctor's degree in statistics, Michigan State University, 1981.

Personal Notes: Originally from Nebraska, Wittig now lives in Brookings while his wife, Deborah, is in Mississippi completing her Ph.D. in sociology. He has two step-daughters, Angi and Mitzi, who both live in Alabama. Wittig collects coins and stamps.



From top:
Oren Quist
Dan Schaal
Carrie Mattson
Suzette Burckhard
Brian Ludens
Ross Abraham

Texan

awarded degree sixty-three years after leaving South Dakota State's campus

New college graduates face similar trials of securing employment, relocating, and beginning lifelong careers. But one of SDSU's most recent graduates has already accomplished those things, and more.

In the fall, Neil Stewart of El Paso, Texas, received his bachelor of science degree—some sixty-three years after leaving State's campus.

When he left school, Stewart was just a tad bit short of graduating—one credit short, to be exact. That's what Dr. Jo Campbell a 1972 SDSU alumna and Stewart's great-niece, discovered one day during a campus visit.

"I wasn't aware that he hadn't graduated until a recent conversation with my dad," she said. "I decided to check into the possibility of getting him an honorary degree, and that's when I found out just how close he had actually been to earning his degree in electrical engineering."

Though requirements for an electrical engineering degree have changed over the years, it was determined that Stewart had enough credits to satisfy the requirements for a bachelor of science degree. So Campbell decided to plan a graduation ceremony for her great uncle.

"I think that someone who spent many years in active and reserve army duty, as well as developing and managing a successful business, needs to receive his earned diploma," she said.

To keep the ceremony a surprise, Stewart's family invented a story to get him into the administration building. Once there, they ushered him into the president's office, where he says he was overwhelmed to find additional family members, SDSU President Robert Wagner and his staff waiting for him. President Wagner, donned in his traditional commencement robe, presented Stewart his diploma.

"I was so surprised and touched," he

said.

"Words just wouldn't come to express my heartfelt thanks to President Wagner and my family."

While he was aware that he was close to finishing his degree, Stewart had no choice but to leave when he did. Scheduled to graduate in 1934, Stewart attended school during an era when many families couldn't afford to put food on the table, let alone finance a college education. "I left for financial reasons," Stewart said. "It was during the Depression, and we needed the money. I had to go to work."

Stewart's days on campus were suddenly replaced by days working at a Brookings filling station. Though he knew working was necessary, he missed taking classes with his friends. "I really enjoyed going to school, and it was difficult to leave my classmates," he said. "I enjoyed my stay here—every bit of it."

His job did allow him to meet many people, including a manager from International Harvester (IH) headquarters in Illinois. The gentleman told Stewart that if he gained some experience in the farm implement industry, he could come to work at IH. Stewart took the advice, and secured employment with the local farmers cooperative. He then went to work with IH in Watertown and, a few years later, was transferred to company headquarters in Chicago.

Just as the Depression interfered with Stewart's education, in 1941 World War II interrupted his career. In July of that year, he was called to active duty.

Stewart was an infantry company commander in the 106th Division when it was ordered overseas to the European

Theatre of War. During the Battle of the Bulge, Stewart and his company were captured and made prisoners of war. Upon his return to the United States, he was assigned to the 11th Reserve Corps in St. Louis. He owned Stewart Truck and Equipment Company in Dixon, Illinois, until his retirement, at which time he relocated to Texas.

Stewart's first wife, Dorothy, died in 1970. He married Dorothy Gates in June 1971. He and his wife return to campus every summer, and stay current with campus happenings through several publications. Though many decades have passed since his days as a student, Stewart still remembers fondly his time at State.

"One of my favorite memories is of the many parades on our beautiful campus that the infantry would put on," he said. "One time, John Phillips Souza, a friend of Professor (Carl) Christensen, came and conducted the band. It was a really great event."

Now that he has earned his degree, Stewart, who enjoys golf, traveling and remaining active in military organizations, has big plans for his future. He will return to school. At the age of eighty-five, he has developed an interest in computers and will enroll at either the University of Texas-El Paso or a community college.

Neil Stewart is flanked by his wife, Dorothy, and Robert Wagner, after receiving his bachelor of science degree.





Summer job led
Belsaas
from engineering to
medicine

Editor's note: In our last issue, we featured Pam Arment as one of three women to graduate from electrical engineering in 1978. We have since learned that there was a fourth, Rebecca Belsaas.

Summer jobs are always important to college students. But for Dr. Rebecca (Lees) Belsaas, one summer job wasn't just important; for her it was life-changing.

While pursuing her electrical engineering degree at SDSU, Belsaas spent two summers working for Medtronics in Minneapolis. The job meshed perfectly with the former nursing major's interest in biomedical engineering. Ultimately, though, her co-workers at Medtronics led Belsaas away from engineering.

"While I was there, some of the engineers said that if I really wanted to get into biomedical engineering, I might want to think about getting an M.D.," Belsaas said. "I got back to Brookings and had two days to get my MCAT application in, so I was really scrambling."

After graduating from SDSU, Belsaas attended the University of South Dakota Medical School for four years, then spent another four years studying radiology at the University of Iowa. Her specialization in radiology stemmed naturally from the interest in computers and other electronic equipment that had originally led her into engineering.

Since 1986, Belsaas has worked as a diagnostic radiologist with Radiology Associates in Rapid City. The job involves

analyzing a wide range of images, including x-rays, CAT scans, ultrasounds and MRIs. That variety keeps her work exciting, Belsaas said.

"Every film and every study I do is different," she said. "I might read a chest x-ray, then an ultrasound of a baby, then a CAT scan of a head."

Belsaas also enjoys her capacity to make a difference. "I think we contribute a lot to medicine," she said. "Just about every patient has some contact with radiology, whether with the diagnosis or the treatment."

Working in medicine has not meant leaving engineering behind entirely, Belsaas said. She called on her engineering education when taking her radiology boards, which tested her knowledge of physics and required her to understand the workings of several machines and instruments.

"My engineering background is very important, because the equipment we use is very sophisticated," Belsaas said. "Not only the hardware, but a lot of the software we use is constantly changing. Engineering helped make me interested in the field, and it has kept me interested."

Technology is important to Belsaas in other ways, as well. Like the other radiologists in her office, she makes use of teleradiography software to receive and analyze x-ray images on her home computer. The software sometimes saves her a midnight drive to the hospital during her weekly night "on call."

Any extra time is important to a woman balancing family and career. Belsaas and her husband, Richard, a 1978

SDSU biology graduate who works as a stockbroker, met and married as college students. Now they spend most of their free hours with their three children: Kristin, Erik, and Andrew.

Belsaas also devotes some of her time to educating others. Each year, she teaches radiology to a class of third-year medical students from the University of South Dakota. She finds teaching "fun and always challenging," she said. "When my students are enthusiastic about learning, I'm very enthusiastic about teaching."

Clearly, education is a priority for Belsaas. Her own life might have been very different if not for one teacher: Duane Sander, dean of the College of Engineering. When Belsaas was an SDSU student, Sander was her advisor. She credits him with helping her get the summer jobs that pointed her toward medicine as a career.

"Dr. Sander was a very good teacher who was there for his students outside of class," Belsaas said. "I felt like I could just drop in and he'd help me."

In spite of some unpleasant treks across campus in the winter, Belsaas calls her time at SDSU "the best" of her twelve years of higher education. The people made the difference, she said.

"Everyone was friendly, both students and teachers," she said. "I really have fond memories of SDSU. I also felt I got a very good education there. I felt I could have gone anywhere after I graduated."

Gifts

put Crothers project on track for success

Recent gifts through *Visions for the Future* have brought the Crothers Engineering Hall renovation and addition a level of support that ensures its ultimate success. The engineering project has so far received about \$2.8 million in gifts and pledges, with verbal commitments exceeding \$1 million, said Edd Storey, interim director of Development at the SDSU Foundation. The total of \$3.8 million exceeds the original goal of \$3.2 million.

One major gift came from Alyn Holt of Cherry Hill, New Jersey, a 1959 electrical engineering graduate who donated 100,000 shares of stock from inTEST Corporation. Holt is co-founder, president, chairman, and chief executive officer of inTEST, which produces interface products for use with automatic test equipment by semiconductor manufacturers, as well as test pockets, interface boards, and probing assemblies.

Holt hopes that his gift, valued at more than \$1.4 million, will help SDSU continue to offer a quality engineering education to its students. Duane Sander, dean of the College of Engineering, feels the gift will do just that.

"This contribution was the largest in this engineering campaign and it really solidified our efforts toward our final goal of \$3.2 million in private funds for the addition," Sander said. "It indicated the confidence that our successful alumni have in our on-going programs. We appreciate their generosity and support."

The Crothers project has received several other generous gifts in recent months. Ronald Schmidt, co-chairman of the board of Artesyn Technologies and a 1963 electrical engineering graduate, has pledged \$500,000. He views the gift as a thank-you for his education and hopes it will benefit SDSU engineering students and faculty alike.

"You have to have decent facilities in order to teach," Schmidt said. "I'm sure the expansion is going to be very positive step."

Edd Storey called the Schmidt and Holt gifts important parts in the success of the Crothers project. "They are a wonderful indication of the level of support of graduates for the College of Engineering," Storey said. "They have really made a significant difference in our ability to make the addition a reality and to make clear to the legislature that support for the project and the College of Engineering is there."

Another type of gift was the result of a campaign organized by Bill Brinker, who earned two civil engineering degrees from SDSU: a bachelor's in 1973 and a master's in 1977. Brinker, a vice president of HDR, Incorporated, and the manager of the company's Sioux Falls office, contacted HDR's nineteen SDSU engineering alumni about contributing to the Crothers addition and renovation.

"I was rather surprised at the response we got back," Brinker said. "When the information was sent out, almost all of the graduates were immediate in providing a response."

Also instrumental to the success of the HDR campaign was Richard Bell, HDR president. Bell, who earned his bachelor's in civil engineering in 1968 and his master's in general engineering in 1970 from SDSU, authorized a company match for the money raised by the employees. The result was a total gift of \$35,100, which will be used to sponsor and develop a civil engineering laboratory in the Crothers addition.

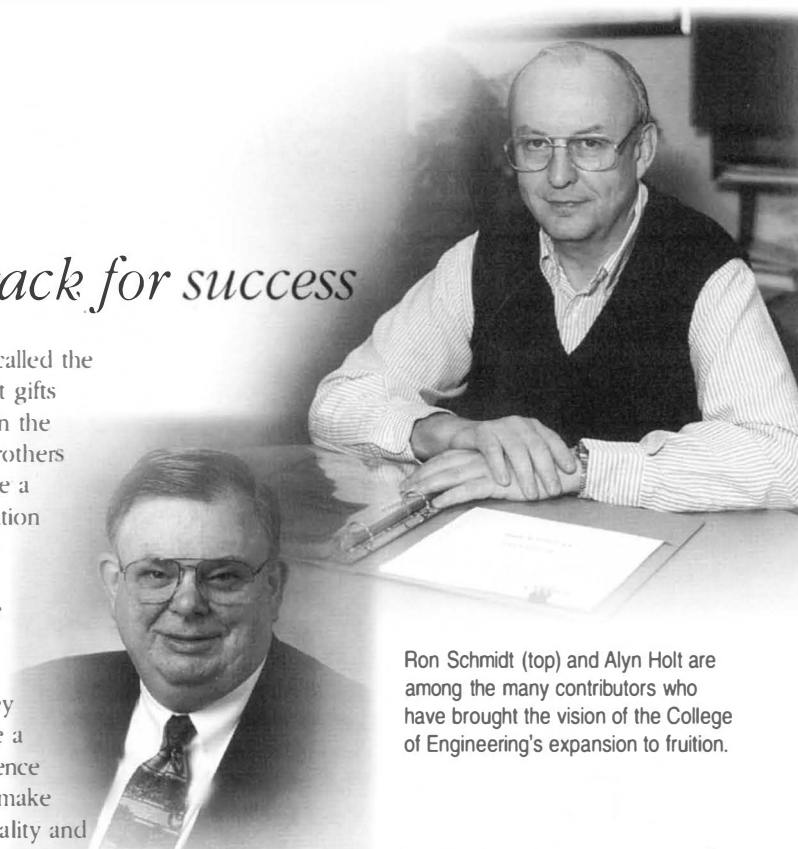
Other SDSU alumni are choosing to support the project through careful planning. Robert Huntmer, a 1944 electrical engineering graduate, was

motivated by the "great opportunity and value" of his SDSU education to contribute \$390,000 to four unique gift annuities for his four grandchildren. Each annuity has two beneficiaries: the non-charitable (Huntmer's grandchild), and the charitable (SDSU).

Beginning immediately, the fund's earnings will provide \$10,000 a year in perpetuity for programs at SDSU. Of that amount, ninety percent will be directed toward the College of Engineering. The remaining ten percent will fund a track scholarship in memory of Huntmer's father, Percy, a 1911 engineering graduate and a Jackrabbit trackster.

All these diverse gifts and pledges to the College of Engineering allow the Crothers project to move forward, Dean Duane Sander said.

"We have requested that a building committee be formed by the Board of Regents and the state engineer," he said. "As soon as that committee is formed, we will proceed to select an architectural/engineering firm to do final designs and bid specifications. We will then publish those specifications for construction contractors to bid. We'd like to finish that entire process in order that contractors can begin construction and renovation as early as possible."



Ron Schmidt (top) and Alyn Holt are among the many contributors who have brought the vision of the College of Engineering's expansion to fruition.

Dean's Club

Contributions made to the Greater State Fund January 1996-May 1997

Support from alumni, corporate donors, and friends has come to be essential to institutions of higher education.

Contributions have made possible the development of activities that have won recognition for the College of Engineering as one of the nation's leaders in engineering education.

We have benefited, and those who have been generous in their gifts share with us the satisfaction that comes from achievements of our faculty and students.

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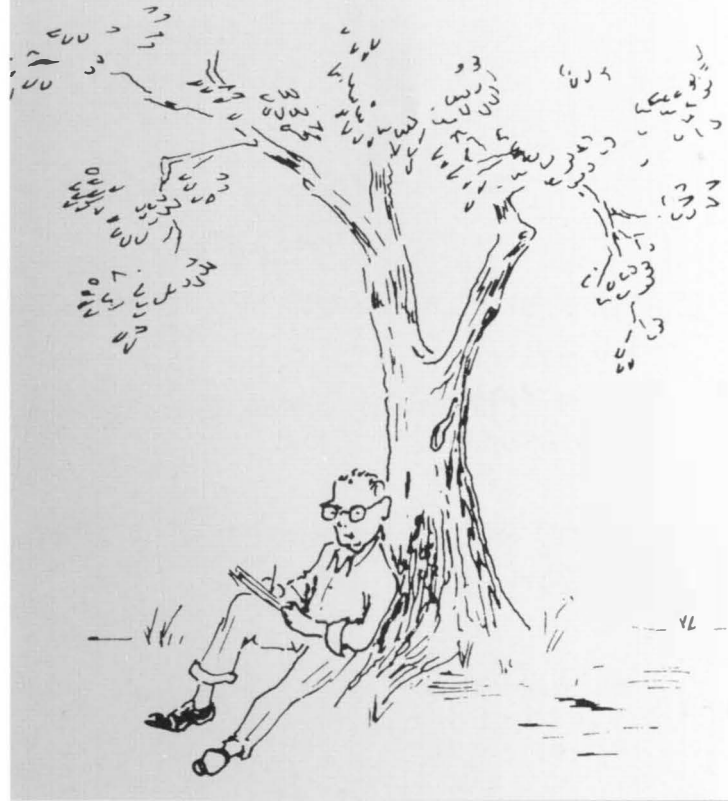
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