

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY MAGAZINE

SPRING 2005

The Future is Now

**Nanotechnology puts School of
Mines on Cutting Edge p. 11**

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...and much more!

Perspectives



Dear Friends,

What an exciting time to be associated with the South Dakota School of Mines and Technology!

Things are changing all over campus, and I couldn't be happier about the track this university is following. You can read more about some of these initiatives and issues in this issue of our Magazine, but here's a brief rundown:

- We were honored to host a recent press conference with Governor Mike Rounds, James Von Ehr, chairman and founder of Texas-based **Zyvex Corporation**, and other dignitaries from our state and region. The governor and I announced that the School of Mines will acquire **highly specialized equipment** from Zyvex for use in evaluating semiconductor circuits at the nanoscale. This is a major step in establishing this university's position in the burgeoning field of nanotechnology. **We will be the only university in the world with this equipment.**

- In related news, the South Dakota Board of Regents approved a **Ph.D. program in Nanoscience and Nanoengineering**. This degree program will bring to campus researchers and students who will advance nanotechnology and investigate ways we can use it to make South Dakota an even better place to live and work.

The Board of Regents approved changes to our **Admissions Standards**. We will implement changes with the fall 2006 freshmen, and follow a **two-year transition period**. Our goal is to attract students who are prepared for the work that is required; engage them in dynamic and challenging engineering and science programs; and prepare them for successful careers.

- The **Lady Hardrockers basketball team** qualified for the NAIA national tournament, and although the team's first-round loss was disappointing, we are very proud of their accomplishments. This year marked the **tenth national tournament appearance** for the Lady Hardrockers since 1994.

- Over the years, this university has been known by many nicknames. We've hired **Stamats**, a higher education consulting firm, to help us discover what internal and external groups thought of the various nicknames. The research concluded that most people like - and know us by - "**School of Mines**," so we have decided to focus on using that as our informal name. It's been an interesting process and is part of a larger effort to examine and improve our recruiting and marketing efforts.

I thank you for all the support you provide to the School of Mines, and I look forward to utilizing the best we have to offer in order to have a positive impact on our great state.

Very truly yours,

Charles Ruch

MAGAZINE

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY
SPRING 2005

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On the cover: Nanomanipulator

The photograph shows a Zyvx Nanomanipulator system at work. The School of Mines purchased a system like this from the Zyvx Corporation of Richardson, Texas. School of Mines researchers will use the equipment to expand nanotechnology research and create economic development opportunities in the region. *Story p. 10*

Campus Profile

South Dakota School of Mines and Technology has been a national leader in preparing world-class engineers and scientists since 1885. Our graduates design, construct, and operate the most modern technology to meet complex challenges such as global warming, health care delivery, energy resource development, mineral extraction and processing, environmental quality, futuristic transportation, and national defense. Our alumni are held in the highest regard by their fellow leaders in industry, consulting, government, health, and education.

School of Mines continuously adapts to meet the needs of engineering and science. Rugged individuals and pioneers in engineering and science founded School of Mines' intellectual environment more than a century ago. Our faculty and students carry on that tradition today.

School of Mines is a state university that provides graduate and undergraduate degrees in science and engineering, as well as an associate of arts degree in general studies.

Fall 2004 Enrollment:

- 2,345 students from 39 states and 20 countries
- Students enter the university with the highest ACT composite in the state and more than half graduating within the top 30% of their high school class.

Costs and Fees:

- Annual undergraduate costs for tuition, fees, books, room, and board total less than \$9,700 per year for South Dakota residents, and less than \$10,800 for residents of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Iowa, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming residents. Annual total costs for all other undergraduates is less than \$14,500.

Research:

- Researchers conduct high-quality research that benefits the state, the region, and the nation through advances in technology and economic development.
- In FY 2004, more than 50 researchers received \$11.9 in funding for 93 projects. Funding agencies included the Air Force Research Laboratory, Army Research Laboratory, NASA, National Science Foundation, Department of Energy, U.S. Forest Service, the State of South Dakota, and many others.

Faculty:

- School of Mines employs 115 faculty members
- More than 87 percent hold the doctorate or other appropriate terminal degree.

Honors and Awards:

- One of America's 100 Best College Buys for the seventh consecutive year
- Accepted into Colleges of Distinction
- Admissions Marketing Report Bronze National Award Winner 2004 for the recruitment publication "Curriculum to Careers."

Placement:

- Average starting salary offers to our grads: More than \$47,000
- More than 91 percent of 2003-2004 graduates placed in jobs in their career fields or graduate professional programs.

Bachelor of Science Degrees

Chemical Engineering
Chemistry
Civil Engineering
Computer Engineering
Computer Science
Electrical Engineering
Environmental Engineering
Geology
Geological Engineering
Industrial Engineering
Interdisciplinary Sciences
Mathematics
Mechanical Engineering
Metallurgical Engineering
Mining Engineering and Management
Physics

Master of Science Degrees

Atmospheric Sciences
Chemical Engineering
Civil Engineering
Computer Science
Electrical Engineering
Geology and Geological Engineering
Materials Engineering and Science
Mechanical Engineering
Paleontology
Technology Management

Doctor of Philosophy Degrees

Atmospheric and Environmental Studies
Geology and Geological Engineering
Materials Engineering and Science
Nanoscience and Nanotechnology

Golden Nuggets

Conference Lays Wall to Wall Concrete

Concrete researchers, contractors, cement plant workers, consulting firms, builders, government agencies, and others converge on the School of Mines in February for the 41st annual Concrete Conference.

"This conference is for anybody interested in creating quality concrete at the most economical cost," Dr. M. R. Hansen, professor, Department of Civil and Environmental Engineering, said. "It's solid concrete for the whole day."

The speaker's list was paved with heavy hitters in the world of concrete. Conference organizers gave a Lifetime Achievement Award to **Henry McKitterick** of GCC Dacotah in Rapid City. McKitterick was honored for his longtime commitment to the concrete industry. McKitterick is an active member of many professional and industry organizations.

E-Week Shows How Engineers Make a Difference

The School of Mines celebrated the 28th annual Engineers Week by inviting students and community members to events that showed the importance of engineers in our world.

Elementary students, middle, and high schools built cardboard bridges, constructed buildings with interlocking blocks, designed intentionally complicated machines to perform a simple task, and took part in other activities to learn about engineering.

For the second year, the School of Mines hosted E-Week GIRLS (Girls Into Real Learning Succeed), a daylong event designed to excite middle and high school girls about careers in science, technology, engineering, and math. The girls heard inspiring and encouraging messages about pursuing engineering and science careers and took part in engaging hands-on activities designed to excite them about the fields.

During the week, School of Mines students learned about opportunities to apply their technical skills to jobs and volunteer activities around the world. They also heard from a speaker who told them that getting straight A's isn't the sole key to success.

"It was a wonderful and exciting week," University President Dr. Charles Ruch said. "It gave us a chance to spread the word about how critical engineers are to our daily lives."

Outstanding recent graduates honored



The 2005 honorees: (pictured left to right) Staci Bogue-Buchholz (ChE '94), Lonnie Snyder (EE and CSc '94), and Ronnie Snyder (EE and CSc '94), Dave Muck (CEE '94). Not pictured: Hillari Clark and Dale Nutall.

Seven School of Mines alumni were honored as recipients of the 2005 Outstanding Recent Graduate Award during an Engineers Week luncheon held February 24.

The Outstanding Recent Graduate program honors graduates who have achieved exemplary career progress and recognition within 10 years of graduation. The program was originated and is sponsored by the Alumni Association and the SDSM&T Foundation. The individuals selected for this award are considered excellent role models to show current students the importance of continued personal growth in a rapidly changing world.

The 2005 honorees: **Staci Bogue-Buchholz** (ChE '94), **Hillari Clark** (GeoE '94), **Cale Groen** (Met '94), **Dave Muck** (CEE '94), **Dale Nuttall** (Mine '94), **Lonnie Snyder** (EE and CSc '94), and **Ronnie Snyder** (EE and CSc '94).

Professor emeritus selected for honor



Dr. Paul Smith

The National Academy of Sciences honored **Dr. Paul Smith**, professor emeritus, by making him an Associate Member. This honor was bestowed for his longtime service on National Academy of Sciences committees.

National Academy of Sciences committees address specific scientific questions of national importance. Committee reports and recommen-

dations often serve as the basis for establishing federal research funding priorities. Smith, now retired as a professor from the Institute of Atmospheric Science, was selected for a lifetime appointment.

"This is a very impressive honor," university President Dr. Charles Ruch said. "Dr. Smith has dedicated his career to advancing science, and this honor reflects his lifetime of work and achievement."

Smith joined the IAS in 1966 and led the Institute's outstanding work in weather radar development and applications. He served as director of the Institute from 1981 to 1996. During that time, he supervised the instrument development and deployment of the special T-28 weather observation aircraft. In addition to his research activities, he taught several courses in the department of Meteorology and some in the Electrical Engineering department. He supervised many students in their radar and instrumentation research.

"Throughout his time at the School of Mines, Dr. Smith has been the model researcher and colleague," Ruch said. "He has set an example of excellence we can all follow."

School of Mines holds 150th commencement

The School of Mines held its 150th commencement December 18, 2004, and awarded more than 85 bachelor's, master's, and doctorate degrees.

Dan Landguth (EE '68) joined The School of Mines



Mr. Dan Landguth

as commencement speaker. During the past 34 years, he has risen through the ranks of Black Hills Corporation to become the company's Chairman of the Board. At Black Hills Corporation, Landguth formed an aggressive and successful senior management team of diversely talented individuals who oversee the electric utility, independent energy, and communications business units. He also has

been active in the community in a variety of organizations and positions.

Lindsay Lipps (IE '04), represented the graduating class. Lipps has served Alpha Delta Pi Sorority in several offices, including president. She also served as president of the Interfraternity Council, Society of Women Engineers, and Alpha Pi Mu Industrial Engineering Honor Society. She has been a participant or member in Tau Beta Pi, Phi Eta Sigma freshmen honor society, Students Against Drunk Driving, M-Week, Order of Omega Greek honor society, and she was an orientation leader for three years.

The university also honored five alumni with

"Distinguished Alumni" awards, given to graduates who have made outstanding contributions in their professions and to the School of Mines. The recipients: **Dr. Maurice Fuerstenau** (GeolE '55), **Dr. Jim Martin** (BS Geol '71, MS Geol '73), **Dr. Duane Sander** (EE '60), **Patrick Tlustos** (CEE '71), and **Dr. Richard Warder, Jr.** (ME '60).

Donation establishes new scholarship

A School of Mines scholarship has been created in memory of the character and values of **Ivan** (Mine '40) and **Doris Reynolds**, Black Hills natives recognized for their cattle ranching, community service, and dedication to youth development.



Ivan and Doris Reynolds

The Ivan and Doris Reynolds Scholarship fund was established by their daughter, Paula Reynolds Hix (EE '73), with a gift to the SDSM&T Foundation. Among the requirements, the scholarship is restricted to students from South Dakota whose family farms or ranches to best reflect the character and values of Hix's parents. Ivan and Doris ranched near Rochford on land that was part of the original 1876 homestead of Ivan's grandfather, Joseph Reynolds. In addition to raising commercial beef cattle, they were involved in community projects, were officers on local school boards and were active in 4H for 30 years. They were members of the Black Hills Pioneer Society and the South Dakota Stock Growers Association.

Throughout their lives, Ivan and Doris were champions of education. They understood that an education opened doors, built self esteem and provided the underpinning for a productive and rewarding life. They believed that all people can achieve their goals through hard work and dedication. They provided the example of the highest standards through their own lifestyle and accomplishments.



Careers in Focus

New Interdisciplinary Science specializations offer students a more competitive degree

The School of Mines has realigned its Interdisciplinary Sciences (IS) degree so students can focus in one of four areas to prepare for a career.

The South Dakota Board of Regents approved the changes in December 2004. The changes went into effect the spring 2005 semester.

“The School of Mines central mission is to provide an outstanding undergraduate education in science and engineering,” said Dr. Sue Shirley, dean of the College of Interdisciplinary Studies. “We believe that we can more clearly align the Interdisciplinary Sciences degree with the stated mission of the university and provide students with a more competitive, more marketable degree by focusing in specific areas.”

The four specializations are:

- **Atmospheric Sciences** - Intended for students preparing for careers in weather forecasting or meteorology or for additional graduate study in atmospheric science or environmental studies.
- **Pre-Professional Health Sciences** - Designed for students preparing to enter medical or dental school, or programs in physical or occupational therapy, chiropractics, optometry, physician assistantships, radiography, or medical technology.
- **Business Applications in Science and Technology** - Will appeal to students interested in the application of business administration or entrepreneurial studies to science and technology endeavors.

- **Science, Technology, and Society** - Educates students preparing for careers in law (with a science/technology emphasis), science and environmental policy, public policy, or public health policy.

All four specializations provide the IS student with a stronger science curriculum.

“One advantage of the change is that every graduate’s transcript will list the specialization,” Shirley said. “That will make it easier for prospective employers and graduate and professional schools to determine each student’s specific area of study.”



*“We see
this change
as a great
opportunity...”*

Dr. Sue Shirley
Dean, College of
Interdisciplinary Studies



The four specializations:

1. Atmospheric Sciences
2. Pre-Professional Health Sciences
3. Business Applications in Science and Technology
4. Science, Technology, and Society

All four specializations provide the Interdisciplinary Sciences student with a stronger science curriculum.

“The specializations will also help students plan their course of study more effectively,” she said. “The specializations will make it more advantageous for students to pursue a minor in another science area, such as atmospheric science, biology, computer science, geology, math, occupational safety, or physics.”

Juniors and seniors currently enrolled in the IS program will be allowed to finish their program of study, but they also have the option of completing requirements for a specialization. Transfer students, freshmen, and sophomores will work with advisors to select the most appropriate specialization for their career goals.

The School of Mines is forming collaborations with other institutions to enrich the program. Students pursuing the Business Applications in Science and Technology specialization will complete a Black Hills State University minor in either business administration or entrepreneurial studies as part of their

degree program.

The Administration has also started conversations with faculty and administrators in the University of South Dakota (USD) health sciences programs (medical school, physical therapy, occupational therapy, public health administration) to explore ways students at the School of Mines can benefit from USD expertise in these fields.

Students will be encouraged to identify internships and other service-learning opportunities and to pursue policy-related experiences such as serving as congressional aides.

“We see this change as a great opportunity for current and future Interdisciplinary Sciences students to leave here with a degree that prepares them for careers that are important to our community and society,” Dean Shirley said.



Women's Mentoring Program

The issue of women in science, technology, engineering, and mathematics fields is critical. Women are traditionally underrepresented, and their loss can negatively affect the quality of our nation's workforce.

The School of Mines is doing its part to increase the number of women pursuing degrees in science, technology, engineering and mathematics fields, a critical endeavor for the university and for society.

Two faculty members are leading the effort. They received a \$200,000 grant from the National Science Foundation to establish a women's mentoring program designed to increase retention rates of women students.

Dr. Andrea Surovek, an assistant professor in the Civil and Environmental Engineering Department, and Dr. Jennifer Karlin, an assistant professor in the Industrial Engineering program have been actively involved in developing programming aimed at improving recruitment and retention of women students since joining the School of Mines faculty in 2003. Other faculty members and university administrators also will be involved in the mentoring project because recruiting and retention is everyone's business.

"Developing a reputation as a science and engineering educational institution friendly to all demographics will help increase the School of Mines' national prominence and attract and retain top students," Karlin said. "Increasing our diversity will also encourage companies looking to recruit from a diverse applicant pool to look here. Also, the need to increase diversity in the engineering and science workforces is a national priority."

The NSF funding was possible because it was tied to a \$500,000 CAREER research grant former professor Kerri Vierling, Ph.D. received. The CAREER program offers the National Science Foundation's most prestigious awards for new faculty



"I'm on my way to becoming a civil engineer..."

Jennie Wentz
Civil Engineering
Lemmon, SD

members. It recognizes and supports the early career-development activities of those teacher-scholars who are most likely to become the academic leaders of the 21st century.

Nationwide, women earn nearly half of all bachelor's degrees in science and engineering, but in 2003, women comprised just 15 percent of the School of Mines graduating class.

Overall, women make up about 30 percent of the student body. Because low retention of women students is one cause of the relatively low number of graduates, the focus of this project is to address retention through a proven mentoring program first developed by the Women in Engineering Program at Purdue University.

The grant funding will run for two years. During that time, the School of Mines will begin the mentoring program and hire a Women in

"It's a close-knit campus, and professors are always available..."

Katie Begeman
Chemical Engineering
Rapid City, SD



Science and Engineering (WISE) program director. While this grant will provide the initial seed money for the director position, the university will actively seek ways to fund the position after the granting period is over. The School of Mines will collaborate on the program with experts on mentoring and assessment from Purdue University and the University of Michigan.

“Because women often change majors out of these fields due to feelings of low self-confidence in their abilities, a major goal of this program is to create a mentoring program that increases student self-confidence and provides a forum where women students can discuss issues, strategies and evaluate plans for success in these fields,” Surovek said.

School of Mines believes the program will:

- Raise the self-confidence of participants.
- Increase the retention rate of participants.
- Provide relevant information about career opportunities in science and engineering fields.

The School of Mines uses other programs to promote science and engineering to women. During Engineers Week 2003, a pilot program was offered called E-Week GIRLS (Girls Into Real Learning Succeed) for more than 125 middle- and high-school



“I knew the School of mines would be a great place to start pursuing a career...”

Inchong “Jan” Lucks
Computer Science
South Korea

students. During the daylong event, students participated in hands-on activities that demonstrated how engineering and science apply to real life, and speaking with professional engineers, scientists, professors, and other successful women. The School of Mines offered the program again

during the 2005 Engineers Week in February. Information about E-Week GIRLS is available at www.hpcnet.org/SDTechEWeekGirls.

“This issue is a priority for this university,” School of Mines President Dr. Charles Ruch said. “A successful university or business needs the contributions of our entire population, and we will do what we can to make sure that happens.”



“There are lots of people on campus willing to help...”

Melissa Huntimer
Civil Engineering
Omaha, NE



From the Pros to the Hills

“There are two major keys to success.”

Former NFL wide receiver takes helm of Hardocker football program

Dan Kratzer
Hardocker
Football Coach

When Dan Kratzer became the Hardrockers' football coach in March, he brought a full resume. His short National Football League career was full of lessons. He played for three Hall of Fame coaches who taught him skills that formed the framework for his own successful coaching career.

Coach Kratzer has been the assistant head coach and receivers' coach at Kent State University, an NCAA Division I school, for the past four years. He spent six seasons as head coach at Lindenwood University in Missouri, where he guided the team to its first ever NAIA playoff game in 1998. He served as head coach at Hastings College in Nebraska, where he won conference championships in 1991 and 1992, and guided the team to three NAIA playoff appearances. He also served as an assistant at Miami (Ohio) in 1986, as the head coach at Ohio Northern University in 1984 and 1985, and as an assistant at Indiana University in 1983.

A native of Lathrop, Mo., Coach Kratzer received a bachelor's degree in physical education from Missouri Valley in 1971, and earned his master's degree in education from Central Missouri State University in 1976. He was selected in the eighth round of the 1972 NFL draft by the Cincinnati Bengals and moved to the Kansas City Chiefs in 1973.

He and his wife Suzanne have two grown children, daughter Danielle (Fahey) and son Reggie, who played for his father at Lindenwood. They are proud grandparents of Reagan Fahey.

Steve Buchholz, School of Mines Public Information Manager, sat down with Coach Kratzer for an interview, excerpted below.

Why did you want to coach at the School of Mines?

I've been at Division I for the past four years, and I've been there on other occasions. I've found that the higher you go in levels of competition, the more demanding it is away from your family. High school and small college coaches put in as many hours as anybody else, but you can still have a normal social life and a normal family atmosphere. At a major college, you are totally focused on football, recruiting, and players. At a small college, there is time to watch the other programs compete and enjoy what is a more family-friendly atmosphere.

When I came here for the interview, I fell in love with the area because of the beauty of the mountains and the prairie being right together. But the thing that really impressed me was the people. I'm a Midwesterner at heart, and I think there's a wholesomeness and friendliness in the Midwest that doesn't exist everywhere in the country. When I talked to the young men on the team, I was struck by their uniqueness and their focus. They are engineers, science, and math students, and they are going to be engineers and scientists. When you have young men who are focused and disciplined like that, they're relatively less complex to coach.

What is your recruiting strategy?

In Division I, the main priority was football players. It's not true that I don't want good football players because I do. But my main priority is recruiting engineers and science and math students who are good athletes. That makes the pool smaller, so you search a little harder. You may work a little bit

harder recruiting one individual player, but it would be an injustice to recruit a player who could not succeed here. It would be an injustice for him and for the program.

The thing I want to be able to do is recruit nationwide. I feel we can recruit against Georgia Tech, Purdue, Colorado Mines, and Carnegie Mellon. We have a degree that's just as valuable as those degrees, plus we have Ph.D.s in the classroom and there's probably no place in the country that's doing more research in certain areas than we are, and I think that intrigues the athletes we'll recruit.

How will you define success for the School of Mines football program?

No matter where you are, you will be judged by your won-loss record. We are going to strive to have a winning season. Having back-to-back conference championships would be a success and that's what I want to be able to do. I don't want to lower my standards for what success might be. It can be done. It's not something you can do overnight, but I think there's a very supportive family here in the athletic department and that makes a difference.

What are keys to football success?

There are two major keys to success. First, we need to have the financial capability to recruit students like our opponents. Second, players have to learn how to practice. There is only one way to play the game - learning it effectively and doing it full speed. So the harder we practice, the easier it is to play the game.

What kind of player do you want?

I like to see athletes who can run. But whether we're tall and lean or short and stocky, we have an advantage because engineers, scientists, and mathematicians all have the advantage of understanding angles. That's what football is about. It's about angles, it's about force, and it's about velocity. So we should have a little advantage when it comes to that.

I also want athletes who are competitive. I want them to be spirited. But I also want them to be the image of the all-American guy. That's kind of fallen to the wayside in professional sports today. It's about how much attention I can get. That doesn't work in a team sport. You'll get your attention by the way you perform, not while you perform.

Describe your offensive and defensive style.

My emphasis has always been offense. I've always been an offensive coordinator, and I like the West Coast style and a



New Hardrocker football coach Dan Kratzer is a hands-on leader, even spending time in the weight room helping his players learn new techniques and urging them to work hard.

multiple formation offense. I like to be creative in formations and plays. I also like to be balanced because if you have a good running game, you can have a good passing game. We are going to build on our defense by adding a few coverages and create a little more movement up front, install a new offense, and place emphasis on special teams because you can win one or two games because of special teams each season.

Where do you see the School of Mines football program in five years?

I see it being a lot different than it is right now. I can see us being competitive for the conference championship, being proud of the fact that you're a football player at Tech, and I see people wanting to come watch the team play. I also see engineering, science, and math students from all the (tuition) exchange states knowing about us, hearing of us, and wanting to see what the School of Mines is like. I see the football program as a positive part of the university.



Lofty Goals? **You bet.** But we're South Dakotans.

We **KNOW** we can do it.

Forging a Stronger Black Hills Economy

- 7,500 new jobs
- \$750 million in new capital investment
- 15 new technology-based businesses
- 6,183 jobs retained at Ellsworth Air Force Base
- 1 new mission attracted to Ellsworth
- 400 low-income families assisted with home ownership
- 20 percent increase in air traffic

Black Hills Vision Investing in Our Future

Take one mountain range ...

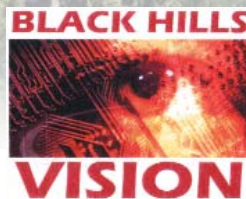
Black Hills area visionaries, including School of Mines administrators, are developing creative strategies to create a high-tech, vibrant economic future for western South Dakota.

The group, Black Hills Vision, which has over 110 contributors representing 4 Black Hills counties, every Black Hills community, and many leading Banks, Utilities and Businesses, hopes to create an opportunity environment for diversifying the regions economy.

Black Hills Vision acts in the tradition of the people of South Dakota, a special breed of Americans who set long-range goals and work on them until the project is successful. That's how Gov. Mike Rounds described the "mountain carvers" of the state when he announced his 2010 Initiative, a strategy that outlines plans for expanding South Dakota's economy, establishing the state as a leader in research and development, grow tourism, and promote South Dakota as having the best quality of life in the United States.

Black Hills Vision will contribute to that goal by creating economic prosperity that will create opportunities for those with Dakota Roots. Those who want to stay and live in the Black Hills and those who may someday want to return.

Black Hills Vision has raised over 3 million dollars to create and retain jobs at Ellsworth Air Force Base, expand air markets for new tourist and business travelers, operate a business incubator at the SDSM&T



campus, and create a technology corridor opportunity environment that will capitalize on opportunities created by the Governor's 2010 Initiative, efforts to open a Deep Underground Science and Engineering Laboratory at Homestake and the ever growing opportunities in high-tech emerging from SDSM&T.

"We have always believed that the university is a cornerstone to developing a technology-based economic development future for our community, region and state," said Mayor Jim Shaw at a recent announcement, attended by Governor Rounds, at SDSM&T announcing a new integrated Nano-manipulator and integrated circuit testing capability not available at any other university in the world.

The School of Mines is an active partner in Black Hills Vision. The university's Strategic Plan includes an initiative for economic development, and the university has made it a priority to use the research and development work on campus to create economic opportunities for Rapid City, for South Dakota, and for the region.

"This critical strategy for creating the economy of the future here in the Black Hills deserves our energy, time, and effort," School of Mines President Dr. Charles Ruch said. "This is an ambitious plan, but we can accomplish it by working together."

The Future is Now

Nanotechnology puts School of Mines on Cutting Edge

The Center for Accelerated Applications at the Nanoscale (CAAN) at the School of Mines, as well as the university's economic development efforts, took major steps forward with the formation of a new partnership.

The partnership between the world's leading supplier of molecular nanotechnology tools, products, and services and the School of Mines will help bring new high-tech research, development, and commercialization opportunities to the entire state.

South Dakota Governor Mike Rounds visited the School of Mines to announce the cooperative agreement involving Zyvex Corp., the state of South Dakota, and Rapid City economic development efforts. The agreement designates the School of Mines as the exclusive provider of integrated circuit (IC) failure analysis services to the semi-conductor industry.

"I am very proud that Zyvex, and more specifically Jim Von Ehr, has put his confidence in the South Dakota School of Mines and Technology for this cutting-edge technological service," Governor Mike Rounds said. "Zyvex could have chosen any site in the world, but they chose South Dakota because of our people and our ability to work as a team."



South Dakota
Governor
Mike Rounds

Under the agreement, Zyvex will outsource all of its testing services to the CAAN. The Center is one of four research centers created last year by Gov. Rounds' 2010 Initiative. One of the goals of the initiative is to strengthen university research and its commercial applications in South Dakota.

"We are extremely excited to partner with the South Dakota School of Mines and Technology," said James Von Ehr, founder and chairman of Zyvex Corp. "Nanotechnology has been called 'the next industrial revolution' because of its potential to transform manufacturing into a high-margin, environmentally clean industry with the economics and versatility of software.



Mr. James Von Ehr

"South Dakota has made a rare commitment to foster not just academic research, but real commercialization of this field," Von Ehr added. "Investing in research is valuable to society at large, but investing in commercialization, with the jobs that will be created, will have a greater economic payback for the



region that hosts those new companies."

The agreement requires the purchase of highly specialized equipment from Zyvex. The equipment measures structures smaller than 100 nanometers. A nanometer is one-billionth of a meter. As a comparison, a human hair's diameter measures about 200,000 nanometers.

The School of Mines will be the first university to have this type of fully integrated system installed and operational. The probing system will allow the university to utilize the most advanced integrated system developed for IC probing and nanomanipulation.

Electrical characterization of integrated circuits is an integral component of the fabrication and design loop. The need to probe sub-100 nanometer features is relatively new to the semiconductor industry. The Zyvex system is capable of easily landing four NanoEffector(tm) probes within a 125 X 125 nanometer area with better than 5 nanometer resolution.

"The semiconductor industry just keeps making things smaller and smaller," CAAN director Dr. Shawn Decker said. "Until Zyvex developed the equipment, the ability to test integrated circuits at this level did not exist. Along with providing the highest level of IC probing service to current Zyvex customers, my job will be to actively provide IC Probing services for customers in the semi-conductor industry from all over the world. We will soon be open for business here in South Dakota to provide integrated circuit failure analysis at the nanoscale that is not commercially available anywhere else. We are honored and excited to be working with Zyvex on this and other nano level initiatives!"

With data collected from individual on-chip transistors using the Zyvex Nanomanipulator/prober, IC design engineers can feed actual device data into design models to improve modeling accuracy.

"Acquiring this equipment and providing product testing services to the private sector will help create a national reputation for this new research and development center at South Dakota School of Mines

The Future is Now *continued on page 21*



Hundreds of School of Mines and local high school students took part in the seventh "Matters of the Heart: A Health and Wellness Expo." The fair focused on

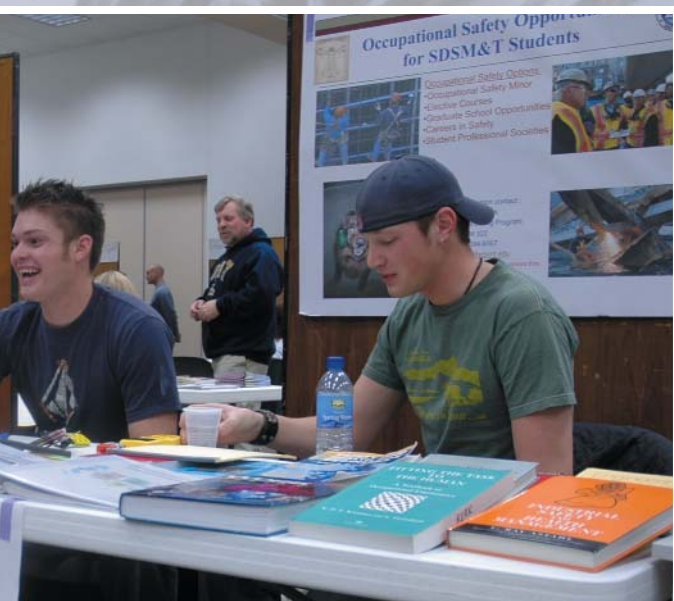
Young patients at Sioux San Hospital in Rapid City now have more books and educational materials available thanks to a donation from the student chapter of the American Chemical Society. Students raised \$700 with a raffle held during National Chemistry Week. The students partnered with the Rapid City Borders bookstore, which offered a 20 percent discount on purchases made with the donation.

School Reaching Out



In the traditional Engineers Week activity of Grubby Games, middle school students see engineering and science at work in all manner of hands-on activities. At left, students compete to see who can move the most "natural resources." At right, a student works her hands through the muck to mine as many marbles as possible.





health issues for young people, such as sports injuries, nutrition, drug, alcohol, and tobacco use and abuse, stress management, sexually transmitted diseases, and other issues young people face.

of Mines ng Out



More than 100 children used interlocking blocks to construct buildings of all shapes and uses during the Kids' Block Contest at the School of Mines. The event was held during Engineers Week.



The well-known paleontologist Dr Philip Currie of the Royal Tyrrell Museum of Paleontology, gave a standing-room only presentation to community members and School of Mines faculty, staff, and researchers. Currie, the 2004-2005 Distinguished Lecturer from the Tyrrell Museum, discussed and fielded questions about "feathered dinosaurs and the origin of birds."

Curriculum...to Careers!



Co-ops and Internships

- More than 75 percent of Tech graduates have relevant work experience through co-ops and internships. That increases their marketability to employers.

Planning Your Career

- South Dakota Tech knows the value of internships, and the Office of Career Planning, Placement, and Cooperative Education helps develop student skills and experiences.
- The Career Planning staff will help you find opportunities, post your resume online, schedule on campus interviews, host job fairs, and coach you for interviews.



Average Starting Salaries

- 2003-2004 graduates averaged starting salary offers of more than \$47,000! That shows employers are looking for students with the kinds of skills School of Mines graduates have.

Featured Major

Mining Engineering and Management



- Excellent starting salaries
- Unique research experiences
- Program scholarships available
- Work anywhere in the world

South Dakota School of Mines and Technology was founded on mining. Our newest degree program brings our oldest major into the 21st Century. Mining Engineering and Management teaches students the engineering, business, and management skills they need to work anywhere in the world.

Learn more about the Mining Engineering and Management program at <http://mining.sdsmt.edu>



New Education and Outreach Office

A new office at the School of Mines will spread the excitement about engineering, science, math, and technology through a variety of programs and conferences.

"The Office of Educational Programs and Professional Conferences will make learning about math and science fun for kids and adults in our community," according to Director Nancy Anderson-Smith. "We will offer educational opportunities for professionals, educators, children, alumni, and anyone else with an interest."

Anderson-Smith and marketing specialist Breanna Bishop will coordinate and host residential and day camps and seminars throughout the year.

"That's one of the exciting things about this effort," Anderson-Smith said. "We are bringing science, math, and technology education to children and adults and building a stronger School of Mines for the future."

The new office will increase awareness of the university, its majors, research efforts, and economic development efforts in the region and across the nation. That fits well with School of Mines' increased focus on marketing and admissions.

"More people will hear about us, understand what we're all about, and - if they're prospective students - see how we can help them reach their goals and achieve their dreams," Anderson-Smith said.

The programs also will help engineers and professionals in other disciplines stay abreast of changes in their fields through professional education. Other programs will provide middle- and high-school math and science teachers continuing education credit, as well as curriculum ideas to share with their students.

"The School of Mines is an engineering, science, and technology leader," Anderson-Smith said. "We want to share that expertise with as many people as possible."

For information about summer programs and professional conferences, call Nancy Anderson-Smith at (605) 394-2692 or Breanna Bishop at (605) 394-2693. You can also visit www.sdsmt.edu/learn.



Nancy Anderson-Smith
Director



Breanna Bishop
Information Specialist

Educational Programs and Professional Conferences @ School of Mines

- Educational opportunities for professionals, students, and alumni
- Continuing education opportunities and curriculum ideas for K-12 math and science teachers
- Fun science and technology classes for children and adults in residential and day camps
- Professional conferences in science and engineering fields

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Opening Doors

Hoffert Professor's travels benefit School of Mines future



This September, Dr. Larry Simonson's relationship with the School of Mines will enter its 40th year. He has reported to five presidents, worked with dozens of fellow professors, and guided thousands of students through their coursework in the Department of Electrical and Computer Engineering.

He has also been much involved with other parts of the university to fill twice that number, from announcing at football games to helping a fraternity find a new house.

In the Spring 2005 semester, he has expanded on a new challenge he has handled for many years - spreading the word about the great things the university and his department are doing and where they plan to go in the future. He is cementing relationships with alumni and supporters and forging new ties with corporations, businesses, and others willing to have a meal or a meeting with the affable professor.

"One of the things I'm doing right now is going out and meeting people so we have a bigger base for support and they know we're here," Simonson said. "What I'm trying to do is open doors."

The Hoffert Professor is not teaching this semester. Instead, he spends much of his working hours the way he has spent much of his vacation time in the past - traveling and talking. One year, during an extended spring break, he traveled from Washington to Arizona and dined with at least one School of Mines alumni every night for 23 days.

"That was an absolutely fantastic time," Simonson said. "You learn what people have been doing, you hear about their success, you learn things that will help the university, and you find people who want to support the school."

In his recent travels, Simonson has been talking

mostly about the Department of Electrical and Computer Engineering. The strategic plan he is formulating is based on a Saturday campus meeting he conducted with the help of Brad Johnson, Vice President of Development for the SDSM&T Foundation. That brought professors, students, economic development experts, and community members together to discuss where the department should be in five years. The process proved successful and Simonson plans to export it to other departments, so they can create their own unique visions.

"That group came up with a lot of great ideas," Simonson said. "When we meet with people, we can show them that plan and show them that we have a vision."



Simonson's efforts fit in perfectly with the university's strategic planning initiative, instituted by School of Mines president Dr. Chuck Ruch. The university plan describes the university's vision and the steps we will take to achieve it.

It also fits with Simonson's dedication to the university where he earned his bachelor's,

master's, and doctorate degrees, and where he has consistently volunteered for duties that positively impacted students' lives. He has given more than time, as well. He has established six scholarships in honor of family members, and on a sweeter note, has given hundreds of jars of his homemade jelly to alumni, colleagues, and friends of the university.

"I take a lot of pride in this university, and when you have pride in something, you want to do things to make it better," he said. "My experience here has been wonderful, and alumni tell me the same thing. I want to help make sure that younger students will have access to those same experiences and opportunities."



Scholarship named after student



The School of Mines student chapter of the American Society of Civil Engineers has renamed its scholarship after **Chad Nienhueser** (CEE, Sidney, Neb.) who died in a vehicle accident in December. The scholarship will now be called the Chad Nienhueser Memorial Scholarship in honor of Chad and his involvement in the organization as a member and past president.

Each year, the chapter awards two \$350 scholarships. Any organization member of active standing who has completed at least five hours of volunteer time on a student chapter project in the previous year is eligible.

CAMP teams unveil vehicles

School of Mines **CAMP** (Center of Excellence for Advanced Manufacturing and Production) teams presented their projects to the campus community and the public during a public event held in the Caterpillar Student Excellence Center.

CAMP is designed to teach students engineering, science, and design skills, as well as the ability to work in teams. Projects displayed included the **mini-Baja**, **mini-Indy**, **solar car**, **robots**, **human-powered vehicle**, **chemical car**, **remote-controlled airplane**, **unmanned aerial vehicle**, and **concrete canoe**.

Students select president and vice president



Justin Wenner (ME, Lemmon) was elected president of Student Association. Wenner has been an active member of the student Senate since his freshman year. He also is involved in the Hardrocker Climbing Club, ASME, Ski and Snowboard Club, Triangle Fraternity, Student Alumni Connection, Phi Eta Sigma, and Tau Beta Pi.



Clark Wismer (EE, Britton) was elected vice president. Wismer, a third-generation School of Mines student, has served on the Student Association finance committee for two years and served as Junior Class President. He also is involved with Student Ambassadors, KTEQ, Triangle Fraternity, and Student Alumni Connection.

Students present research to legislators

School of Mines students displayed results of their research projects in Pierre during the Eighth Annual Student Research Poster Session.

The students: **Chris Bulian** (MS ChE, Yankton), "Energetic Composite Materials Comprised of Nanoscale Reactants," **Shela Carpenter** (Chem, Rapid City), "Water Treatment;" **Chandan Das** (Ph.D. AEW, India), "Role of Conservation Management Practices in Reduction of Regional Sediment Loading;" **Tyler Earnest** (Chem and Phys, Rapid City), "A New Laser System Developed at SDSM&T;" **Terran Elliott** (Chem, Rapid City), "Development of Recombinant Microorganisms Capable of Producing Organic and Inorganic Biosealants;" **Abdulmenan Hussein** (MS ChE, Rapid City), "Characterization of Polymer Membranes for their Perm-Selective Transmission of Water Vapor and Gaseous Proxy Chemical Warfare Agents;" **Sreedhar Kaipa** (MS MES, India), "Polymer Nanofibers Reinforced Dental Restorative Composites;" **Ajay Konda** (MS ChE, India), "Synthesis of Pamam Dendrimers and Modification of Nafion Membranes;" **Muralidhar Mallem** (MS ChE, India), "Conversion of Lignocellulosic Biomass into Ehanol;" **John McCanna** (IS, Eden Prairie, Minn.), "NASA Missions Research and Outreach;" **Sugar Mijir** (MS CE, Mongolia), "Air-Entrained Concrete;" **Clare Paul** (MS CE, Rapid City), "Effect of Heavy Metals on Biological Reduction of Iron Oxides by *Shewanella Putrefaciens* CN32;" **Kailash Pradhan** (MS MES, India), "Synthesis of Carbon Nanofibers from Electrospun Nanofiber Precursors;" **Chrianjeevi Pydi** (MS ChE, India), "Synthesis of Pamam Dendrimers and Modification of Nafion Membranes;" **Fanariot Sefa** (Chem, Aberdeen), "Synthesis of Carbon Nanofibers from Electrospun Nanofiber Precursors;" **Katie Standish** (MS ChE, Easton, Md.), "Conversion of Lignocellulosic Biomass into Ehanol."

Students make phonathon a success

These students helped make the SDSM&T Foundation's spring phonathon a success. The two-week push resulted in \$50,231 in donations and pledges. The students made approximately 6,600 phone calls in nine nights.

The students: **Jessie Ashley** (Chem, Rapid City), **Katie Begeman** (ChE, Rapid City), **Alexis Braun** (CEE, Bismarck), **Todd Curtis** (ME, Wall), **Jared Fenton** (ChE, Gillette, Wyo.), **Aubree Horan** (Chem and ChE, Mitchell), **Fe Marie Miske** (Chem and Math, Rapid City), **Jennifer Moege** (Chem, Parkston), **Breanne Vottero** (ChE, Rapid City), **Corinne Vottero** (Chem, Rapid City), and **Liz Weimer** (ChE, Miles City, Mont.)



Campus Briefings

Development Laboratory Dedicated

The School of Mines officially opened the Tech Development Laboratory during a ceremony held at the lab on Saint Patrick Street in Rapid City.

"This laboratory will house several cutting-edge research activities and projects, all designed to expand our knowledge of science and engineering" said Dr. Gautam Pillay, vice president for research

The extra space was necessary because School of



Mines researchers have been so successful in seeking external research funding. Research grants totaled more than \$11.9 million in the 2004 fiscal year.

To address the concern, the SDSM&T Foundation purchased a building, situated near campus southern border, which includes 14,600 square feet of space. The state of the art research laboratory will contain office space, classrooms, labs and processing areas for several funded projects.

"The Laboratory has become a reality on our campus due to the efforts of former Senator Tom Daschle and Senator Tim Johnson and Representative Stephanie Herseth," said School of Mines President Charles Ruch. "My sincere appreciation goes out to them and their staffs for identifying resources made available through the Army Research Laboratory."

The Tech Development Laboratory is one very visible and tangible result of the more than \$55 million dollars in Department of Defense funding that has been directed to the School of Mines through the SD Congressional Delegation since 2001. During his time in the House of Representatives, Senator John Thune was also instrumental with these efforts.

Employers Recruit Students



During Career Fair

Nearly 40 companies from around the country came to campus in February to recruit School of Mines students for fulltime employment and for internships.

More than 90 percent of Tech's 2003-2004 graduates have found work in their career fields or are attending graduate or professional programs. The graduates who entered the workforce received average starting salary offers of more than \$47,000.

"Despite a tight job market, School of Mines graduates are finding excellent work in their fields," Darrell Sawyer, director of Career Planning and Placement, said. "That shows that employers are looking for students with the kinds of skills Tech graduates have. They leave the School of Mines with the theoretical and practical knowledge and the experience they need."

US Bank Sign Dedicated

The School of Mines dedicated the university's new electronic message board during a ceremony held outside the Dunham Field at O'Harra Stadium.

The full-color message center, manufactured by Daktronics in Brookings, measures 32 feet by 96 feet and was made possible through a gift from US Bank. The sign also honors George (ME '56) and Nancy (EE '57)



US Bank President Pat Burchill (left), School of Mines supporter George Dunham (ME '56), and US Bank Vice President Patty Hogan helped dedicate the electronic sign at O'Harra Stadium.

Dunham's lifelong support of the School of Mines and the Hardrock Club.

US Bank regional president Pat Burchill, who was present at the dedication, said, "Dunham Field is a unique athletic facility because it is used by many of Rapid City's teams. We wanted to be a part of this project."

The message center promotes campus events and will recognize significant accomplishments at the university and in the Rapid City community.

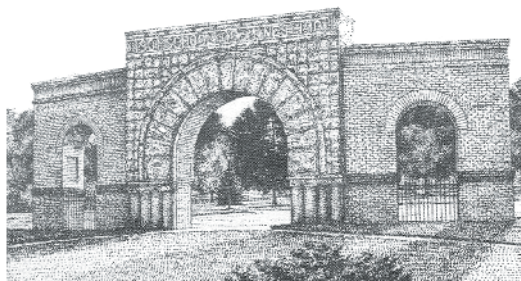
School of Mines Announces Hall of Fame inductees

The first-ever inductees into the Athletic Hall of Fame were recognized and inducted during a Hall of Fame ceremony on campus.

The 2004 Hall of Fame Inductees included the Team of the Year, the 1954-55 SDIC Championship Hardrocker basketball team. Individuals included: Football: **Doug Blackwell** (Met '52) and **Jim Guthrie** (MinE '79); Basketball: **Chuck Neller** (ME '58, Deceased) and **Doug Schlepp** (Met '74); Track and Cross Country: **Monte Evans** (EE '73); All Around Athlete: **Jim Lanphere** (GenE '57); Women's Basketball: **Kerri (Meyer) Crosby** (ChE '81) and **Terri Meyer-Sipe** (GeolE '82); Women's Volleyball: **Laura (Gronewald) Newman** (GeolE '93); Golf: **Mark Lux** (MinE '80); Builder: **Dr. Harvey Fraser** (Former School of Mines President); Coach: **Bob Hunt** (BB, Golf, WBB, Deceased); **Barney Lewellyn** (FB); **Clare Ekeland** (FB, VB, Golf, Track, Deceased); **Sonny Coyle** (FB, Deceased), and **Gary Boner** (FB); and Administration: **Harold Goodell** (Athletic Director, Deceased), and **Darold "Dud" King** (Athletic Director, Deceased).



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The School of Mines is committed to an active research program that expands knowledge, pushes technological and scientific advancement, and contributes to economic development in the state and region.

So far in the 2005 fiscal year that began in July, School of Mines researchers have received more than \$4.7 million in sponsored research and development funding, a \$2.3 million increase over the previous year.

"Our researchers are doing excellent work, and this level of funding recognizes that," university President Dr. Charles Ruch said.

The School of Mines is home to several research institutions and centers, and plans are underway to expand the number of graduate degrees and to enhance the technology-transfer process.

Mr. William Arbegast, director, Advanced Materials Processing and Joining Laboratory, and **Dr. Anil Patnaik**, assistant professor, Department of Civil and Environmental Engineering, received \$70,000 from the National Science Foundation for the project, "Friction Stir Processing Industry/University Cooperative Research Center." **Mr. Arbegast** also received \$345,000 in additional funding from the Edison Welding Institute (Prime: United States Department of Defense - Army Research Lab) for the project, "Materials Joining for Army Weapons Center."

Dr. Sookie Bang, professor, Department of Chemistry and Chemical Engineering, and **Dr. Venkataswamy Ramakrishnan**, distinguished professor emeritus, Department of Civil and Environmental Engineering, received \$12,250 in additional funding from the National Science Foundation for the project, "Performance of Microbiologically Enhanced Concrete Structural Elements."

Dr. Gale Bishop, director, Museum of Geology, and professor, Department of Geology and Geological Engineering, received \$9,600 from Georgia Southern University (Prime: United States Department of Education) for the project, "2004-2005 St. Catherines Sea Turtle Assistantship."

Dr. Arden Davis, professor, Department of Geology and Geological Engineering, received \$5,000 in additional funding from the David and Lucile Packard Foundation for a "Scholarship Grant for James Sanovia."

Dr. David Dixon, professor, and **Dr. Patrick Gilcrease**, assistant professor, Department of Chemistry and Chemical Engineering, received \$19,600 from KL Process Design Group, LLC (Prime: United States Department of Agriculture-Forest Service) for the project, "Pretreatment of Biomass Using Chemical and/or Physical Means to Enhance Cellulose Hydrolysis."

Ms. Barb Dolan, director, Student Information Systems/Title III Project, received \$324,061 in additional funding from the United States Department of Education for the project, "Strengthening Student Success Through Student Data System Enhancement and Equipment Upgrades."

Dr. Daniel Dolan, professor, Department of Mechanical Engineering and co-director, Center for Advanced Manufacturing and Production, **Ms. Barbara Dolan**, **Dr. Kathy Antonen**, professor, Department of Humanities, and **Dr. Michael Batchelder**, professor, Department of Electrical and Computer Engineering and co-director, Center for Advanced Manufacturing and Production, received \$400,000 from the National Science Foundation for the project, "CSEMS Scholarships for CAMP Students."

Dr. Edward Duke, manager of analytical services, Engineering and Mining Experiment Station, and professor, Department of Geology and Geological Engineering, received \$512,100 in additional funding from NASA for the project, "The Use of Remote Sensing for Monitoring, Prediction, and Management of Hydrologic, Agricultural, and Ecological Processes in the Northern Great Plains." **Dr. Duke** also received \$87,500 in additional funding from NASA for the project, "South Dakota Space Grant College and Fellowship Program."

Dr. Hao Fong, assistant professor, Department of Chemistry and Chemical Engineering, received \$64,905 from the National Institutes of Health for the project, "Dental Composite Resins with Polymer Nanofibers."

Dr. Brian Hemmelman, associate professor, Department of Electrical and Computer Engineering, received \$15,499 from RealTronics Corp. (Prime: Army Research Laboratory - United States Department of Defense) for the project, "Field Programmable Array Optimization of WallVision."

Ms. Carrie Herbel, collections manager, instructor, and preparatory, Museum of Geology, received \$20,900 from the United States Department of Interior - National Park Service for the project, "Curatorial Backlog of Museum Specimens, Badlands National Park."

Dr. Chris Jenkins, professor, Department of Mechanical Engineering, received \$60,000 in additional funding from NASA for the project, "Phase 2 - Optical Diagnostic System for Solar Sails." **Dr. Jenkins** also received \$55,820 in additional funding from Triton Systems, Inc. (Prime: Air Force Research Laboratory-Department of Defense) for the project, "Innovative Coating Design to Shape Compliant Optics Into a Parabolic Net Shape."





Dr. Jon Kellar, chair and professor, Department of Materials and Metallurgical Engineering, received \$585,000 from the South Dakota Board of Regents for the project, "Center for Accelerated Applications at the Nanoscale." **Dr. Kellar** and **Dr. Maribeth Price**, associate professor, Department of Geology and Geological Engineering Department, received \$11,901 in

additional funding from the National Science Foundation for the project, "Plague Dynamics in a Black-Tailed Prairie Dog Complex in North-Central Montana and Its Implications for Prairie Dogs in South Dakota." **Dr. Kellar** also received \$10,000 from the National Science Foundation for the project, "Northcentral States Nanosystems Workshop."

Dr. Charles Kliche, professor, and **Dr. Zbigniew Hladysz**, professor, Mining Engineering and Management program, received \$54,487 in additional funding from the United States Department of Labor - Mine Safety Health Administration for the project, "Mine Health and Safety Training."

Ms. Deborah Mitchell, director, Apex Gallery, and associate professor, Department of Humanities, received \$1,812 from the South Dakota Humanities Council for the project, "China: Exploring the Interior."



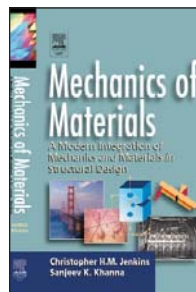
Dr. Jan Puszynski, dean, College of Materials Science and Engineering, and professor, Department of Chemistry and Chemical Engineering, received \$50,000 from the University of Minnesota (Prime: United States Department of Defense) for the project, "Processing Behavior of Nanoenergetic Materials."

Dr. Venkataswamy Ramakrishnan and **Dr. Anil Patnaik**, assistant professor, Department of Civil and Environmental Engineering, received \$22,000 in additional funding from the South Dakota Department of Transportation (Prime: United States Department of Transportation) for the project, "Optimized Aggregate Gradation for Structural Concrete."

Dr. John Weiss, associate professor, Department of Mathematics and Computer Science, received \$14,501 from RealTronics Corp. (Prime: Army Research Laboratory - United States Department of Defense) for the project, "Advanced Signal Processing and Target Characterization Methodologies for Opaque Material Sensing Applications."

Dr. Patrick Zimmerman, director, Institute of Atmospheric Sciences, received \$183,819 from the United States Department of Agriculture-Natural Resources Conservation Service for the project, "Marketing Carbon Sequestration Credits."

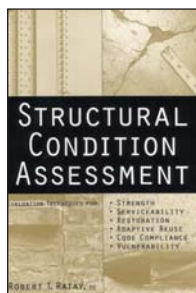
Dr. Chris Jenkins, professor, Department of Mechanical Engineering, co-authored the textbook, *Mechanics of Materials - A Modern Integration of Mechanics and Materials in Structural Design*, published in 2005 by Elsevier Academic Press.



Dr. Roger Johnson, professor and chair, Department of Mathematics and Computer Science, has had two papers accepted for publication. The first, "Optimal Keno Strategies and the Central

Limit Theorem," addresses optimal play for a payout schedule that is commonly used in video keno in Deadwood. It has been accepted for the journal *Teaching Statistics*. The second, "Illustrating Basic Probability Calculations Using Craps," examines the use of calculations related to the "pass-line" bet of the dice game craps in the classroom. It has been accepted for the journal *Teaching Mathematics and Its Applications*.

Dr. Judy Sneller, professor, Department of Humanities, recently had two refereed papers accepted for publication - "Last Laughs: Exploring Gender Difference with Humor" was accepted for publication by *International Journal of the Humanities* and "A Web Dream Team: The Seven Principles and WebCT," was accepted for publication in the Winter 2004 issue of *Academic Exchange Quarterly*.



Dr. Andrea Surovek, assistant professor, Department of Civil and Environmental Engineering, co-authored the chapter, "Reliability-Based Condition Assessment" in the book, *Structural Condition Assessment*, published in 2005 by John Wiley & Sons.



The Future is Now *continued from page 11*

and Technology," said Harvey Jewett, president of the SD Board of Regents. "It will also provide a useful research environment for the university's newly approved Ph.D. program in nanoscience and nanoengineering."

Rapid City Mayor Jim Shaw agreed. "We have always believed that the university is a cornerstone to developing a technology-based economic development future for our community, region and state," he said. "Our economic development community has been preparing programs and resources for many years now, like the new business incubator at the South Dakota School of Mines and Technology campus. We are prepared and poised to participate in this bright future."

Rounds announced that the state has provided a \$250,000 grant to help acquire the equipment. Additional funds were provided through a loan from the Rapid Fund, a local economic development revolving loan fund.



Memorials

The School of Mines family lost seven of its own in recent months. Three students lost their lives in two unrelated traffic accidents, a longtime coach and friend of the university passed away after a lengthy illness, and three former faculty members also passed away. We are poorer for their loss but richer for having enjoyed their association with this university.

Danielle Rebecca Beving



Danielle Rebecca Beving 20, daughter of Charles and Holly (Pfaff) Beving. She attended Clark schools and graduated from Clark High School as an honor student in 2002. She began to race motorcycles at the age of four and received her professional motorcycle license when she turned 16. She raced every year at local tracks in Sioux Falls and Pipestone, Minn., as well as the Sturgis Motorcycle Rally. She was an avid outdoorswoman who enjoyed hunting, fishing, rock climbing, snowmobiling, and snowboarding. Danielle was a second year Industrial Engineering major. She also was a member of Center for Excellence in Advanced Manufacturing and Production's (CAMP's) Indy Car Team.

Clyde L. Harbison



Clyde L. Harbison, 91, a former School of Mines faculty member, died Thursday, March 10, 2005 at St. Mary's Hospital in Rogers, Arkansas.

Mr. Harbison received a BA from Wabash College in 1935 and an MA degree in mathematics from Indiana University. In 1941, he accepted a teaching job with the School of Mines, where he taught for 38 years. During World War II, however, he served in the Navy for four years. During his spare time, he built many homes in the Rapid City area and worked with the Boy Scouts. He enjoyed hunting and fishing in the Black Hills. After retiring from teaching, he farmed and ranched in western South Dakota until 1993 when he retired.

Robert P. "Bob" Hunt



Robert P. "Bob" Hunt, 88, life-long Rapid City resident, teacher, and coach, passed away February 4, 2005, following a long illness.

"Coach" Hunt graduated in 1933 from Rapid City High School where he won the 1933 state pole vault championship and was a member of "Euc" Cobb's state tournament basketball team. At the School of Mines, he lettered in football, basketball, and track. At the University of Northern Iowa, he won the AAU pole vault championship in 1937 and 1938.

He began his teaching career in 1941 in Iowa before

enlisting in the United States Army Air Corps in 1942 and serving overseas as a bombardier navigator in a B-17. He was shot down over Austria in May 1944 and was a prisoner of war until April 1945.

His 35-year tenure at the School of Mines began in 1946 as an assistant professor and head basketball coach. Bob coached the School of Mines basketball team to their first conference championship in 1955. Bob also served as golf coach for 10 years, winning five conference and four district championships.

Coach Hunt started the women's basketball program in 1975. Under his guidance, the Lady Hardrockers won two conference Championships, a state championship, and recorded 86 wins in six years. He also served as an assistant coach in football and track and as intramural director for 25 years.

Dr. William "Will" Klemm



Dr. William "Will" Klemm, 85, a former School of Mines professor, died March 19, 2005, in Rapid City.

Dr. Klemm graduated from the University of Illinois at Urbana-Champaign in 1940 with a B.Sc. in Chemical Engineering. He was awarded a scholarship to attend Massachusetts Institute of Technology and graduated in 1946 with a Ph.D. in Chemical Engineering.

His graduate studies were interrupted during World War II when he was assigned to work in research for the National Defense Research Council. He was awarded a Certificate of Merit from the United States Office of Scientific and Research Committee for his contribution to the war effort. After teaching at several universities, he joined the School of Mines Chemical Engineering faculty in 1975. He was a member of the American Chemical Society, the American Institute of Chemical Engineers, and the American Ceramic Society.

Trent Allen Matt



Trent Allen Matt, 21, son of Marion and Darlene (Nachtigall) Matt. Trent attended schools in Philip and graduated in 2002. While in school, he participated in football, wrestling, baseball, and track. He was in his third year at the School of Mines, majoring in Mechanical Engineering. He was a member of Triangle Fraternity, an organization where he had many friends. He loved all outdoor activities, including snowmobiling, four-wheeling, snowboarding, and hunting. He was an avid Denver Broncos fan.

All Memorial photos courtesy of the families of the deceased, and SDSM&T Student Association.

Henry A. Morris



School of Mines student **Henry A. Morris**, 55, of Rapid City, died Thursday, March 17, 2005, in Rapid City. Mr. Morris was a gifted salesman and spent several years selling Kirby vacuum cleaners and eventually became a distributor for Scott and Fetzer. He enjoyed reading and fishing, but his true avocation was pool. He was a life long student of the game and a very skillful player. Mr. Morris had also become an entrepreneur by starting a house painting business.

Probably the biggest change in his life had just begun. For many years, Mr. Morris wanted to be an adolescent counselor. He was currently enrolled at the School of Mines in pursuit of that dream. He had also become a Court Appointed Special Advocate (CASA) and in that capacity represented children in the judicial system, many times testifying on their behalf.

Chad Arron Nienhueser



Chad Arron Nienhueser, 22, son of Martin and Krysti (Carlson) Nienhueser of Sidney. In high school, he was named to the National Honor Society and Who's Who Among American High School Students and was given the Rotary Student of the Year award. At the School of Mines, Chad majored in Civil Engineering. Chad maintained an active lifestyle, participating in Triangle Fraternity and serving as Chair of their Leadership and Development Team. He also served as Financial Chair of the Student Association and held multiple offices in the American Society of Civil Engineers. He was initiated into Order of Omega Greek Honor Society.



Personnel Changes

Welcome:

- **Daniel L. Kratzer**, Faculty, Head Football Coach/Assistant Professor, Intercollegiate Athletics/Physical Education (3/2/05)
- **Christina M. Schmit**, Exempt, Director, Student Activities and Leadership Center (3/1/05)
- **Nancy L. Anderson-Smith**, Exempt, Director Educational/Summer Programs and Professional Conferences (2/1/05)
- **Dr. Nam-Soo (Peter) Kim**, Exempt, Research Scientist I (Postdoctoral Fellow), Center for the Accelerated Applications at the Nanoscale (2/1/05)
- **Breanna V. Bishop**, CSA, Information Specialist, University and Public Relations (1/24/05)

- **Cabot-Ann D. Christofferson**, Exempt, Research Scientist I, Graduate Education and Sponsored Programs (1/24/05)
- **Dr. Qianlai Zhuang**, Faculty, Associate Professor, Institute of Atmospheric Sciences (1/13/05)
- **Kelli R. Shuman**, CSA, Personnel Assistant, Human Resources (1/11/05)
- **Joseph L. Piette**, CSA, Secretary, Civil and Environmental Engineering (1/10/05)
- **Jason J. Kusler**, CSA, Information Specialist, Intercollegiate Athletics (1/3/05)
- **Dr. Artem E. Masunov**, Faculty, Assistant Professor, Chemistry and Chemical Engineering (1/3/05)
- **Charles F. Layton**, Exempt, MSHA Parts 46 & 48 Health and Safety Trainer, Mining Engineering and Mgmt Program (1/1/05)
- **Dr. George D. O'Clock Jr.**, Faculty, Associate Professor, Electrical and Computer Engineering (1/1/05)
- **Dr. Cynthia Holte**, Faculty, Instructor, Chemistry and Chemical Engineering (1/1/05)
- **Dr. Shawn P. Decker**, Exempt, Director, Center for Accelerated Applications at the Nanoscale (12/1/04)
- **Aaron C. Costello**, Exempt, Research Scientist II, Additive Manufacturing Laboratory (12/1/04)
- **Charles R. Henris**, CSA, Fabrication Technician, Center for Accelerated Applications at the Nanoscale (11/1/04)
- **Dr. Guangyu Fan**, Exempt, Research Scientist I (Postdoctoral Fellow), Chemistry and Chemical Engineering (11/1/04)
- **Michael T. Greenwald**, temporary Exempt, Research Scientist II, Museum of Geology (11/1/04)
- **Alisha M. Reinhart**, CSA, Library Technician, Devereaux Library (10/1/04)

Farewell:

- **Kristy J. Engle**, CSA, Payroll Assistant, Human Resources (1/18/2005)
- **Robert W. Campbell**, Faculty, Instructor, Social Sciences (12/31/04)
- **James D. Castleberry**, Faculty, Associate Professor, Social Sciences (12/31/04)
- **Paul L. Smith, Jr.**, Professor Emeritus, Institute of Atmospheric Sciences (12/31/04)
- **Thaddeus J. Chase**, Exempt, Research Scientist II, Mechanical Engineering (12/31/04)
- **Travis L. Sieber**, Exempt, Director, Student Activities and Leadership Center (12/19/04)



Calendar of Events

Visit the on line calendar for details
www.hpcnet.org/sdsmcalendar
 For details about K-12 events,
 visit the K-12 calendar:
www.hpcnet.org/SDTechK-12

April 26
 Senior Design Fair – Surbeck Ballroom
May 2-6
 Final examinations
May 6
 Semester ends
May 7
 Spring Graduation – King Center – 9:00 AM
May 9
 West River Math Contest
 Summer Session One and Two Begins
May 10
 Campus Planning Session
May 30
 Memorial Day – No Classes
June 6
 Summer Session Three Begins
June 15-16
 New Student Orientation
June 25
 Western Research Alliance Inventor's Congress
 – King Center 8:00 AM – 2:00 PM
July 4
 Independence Day – No Classes
July 25-28 and August 15-16
 New Student Orientation
August 29-September 1
 Tuition/Fee Payment Days - Bump Lounge
 – Surbeck Center 7:30 AM – 4:30 PM
August 29
 Registration Day
August 30
 Classes begin
 President's Picnic
September 1
 Football vs. Black Hills State – 7:00 PM
September 5
 Labor Day – No Classes
September 10
 Football @ Si Tanka State U.-Huron – 1:30 PM
September 10-17
 M-Week
September 11
 M-Day Picnic
September 17
 M-Day Parade
 Football vs. Mayville State U. – 1:00 PM
 M-Day Dance
September 24
 Football @ University of Mary – 1:30 PM
September 27
 Fall Career Fair
September 29
 YMCA Corporate Cup
October 1
 Football vs. Dakota State U. – 1:00 PM
October 8
 Football @ Black Hills State – 1:00 PM
October 10
 Native Americans' Day Holiday – No Classes
October 15
 Football @ Valley City State – 1:30 PM
October 22
 Football vs. Minot State – 1:00 PM
October 29
 Football @ Dickinson State – 1:30 PM



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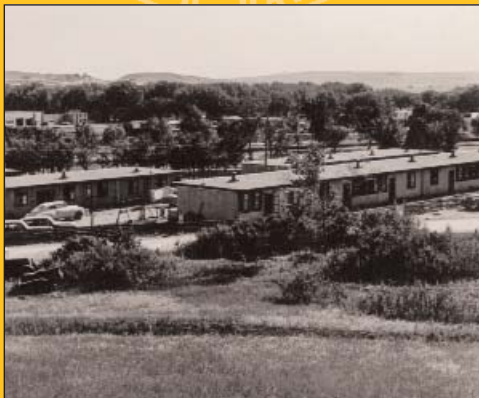
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Tech Trivia

Did you know that...

- That the first permanent student residence hall on campus was built in 1964? It housed married students.



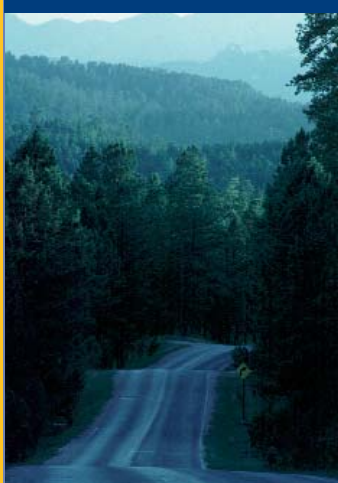
- That the American Society of Civil Engineers student chapter won the 1995 concrete canoe national championship? The canoe, Predator, weighed 90 pounds.



- That Old Main - also called the Liberal Arts Building - was razed in 1994?



7:40 a.m. Rush Hour



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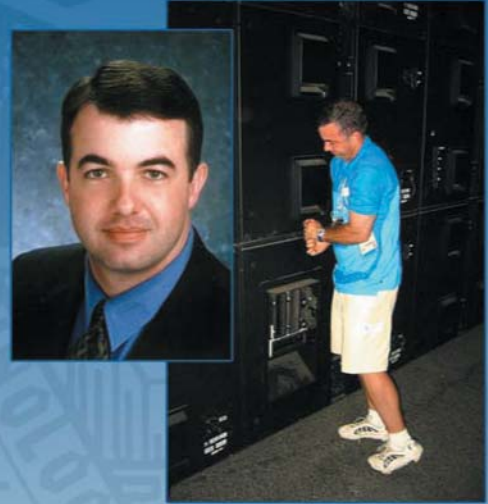
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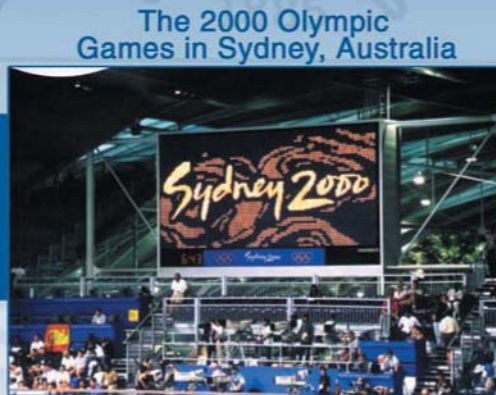
John Mette
1989 graduate of SDSM&T



Projects John has been involved with include:



The 2004 Olympic Games in Athens, Greece



The 2000 Olympic Games in Sydney, Australia



Southampton Football Club
Southampton, England

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