

# SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY MAGAZINE

FALL 2005

## SOARING TO NEW HEIGHTS

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Takes First Place at  
International Competition  
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It's Coming...April 2006 p. 18

...and much more!

## Perspectives



Dear Friends,

As we began the 120th academic year at the South Dakota School of Mines and Technology, the decision to recommend the removal of Ellsworth Air Force Base from the base closure list was welcome news to the entire area. One of our distinguished faculty members, Dr. Sid Goss, is to be commended for his outstanding presentation to the BRAC commission — he did a remarkable job, and I know his presentation and research data played a large part in the BRAC's decision. The cohesiveness of our citizens and local and state congressional delegations was exemplary. Together we have shown what can be done when we work for a

common cause. The process was a wake-up call that while we will continue our support of the base, we must also look to other sources for economic strength, and the School of Mines is committed to be a part of that process.

We are progressing into our third year of a strategic agenda that was developed as a ongoing plan to help us pursue our mission as an institution of higher education in this ever-changing economic environment. Part of that agenda was to define who we are and establish goals for our future. We established four strategic initiatives:

1. Reshape the Learning and Teaching Experience
2. Promote the Acquisition, Discovery and Application of Knowledge
3. Engage and Serve the Broader Community
4. Prepare for Our Future as a National Player in Science and Engineering Education and Research

In order to achieve our initiatives, Stamats, a higher education consulting firm, was hired to help us define our identity and marketing agenda. A new logo was introduced, along with a marketing and recruitment plan that will ensure consistency and a defined focus. The entire plains state region has seen a steady decline in the number of students graduating from high school. Our research has provided us with a direction in order to achieve our enrollment goals and increase the quality of students in spite of the demographic issues.

The construction of the Black Hills Business Development Business Cetner will be completed this spring. We are pleased to host this vital link to the growth of local businesses on our campus. We are working closely with Black Hills Vision, and are continuing to build relationships with universities in other parts of the world. The number of American Indian students and graduates has grown in recent years, but we want to do more to serve this portion of our community, and have created a plan with measurable goals to help us better serve our minority student population and attract new students.

As we strive to keep up with ever-changing technology and be one of the top engineering and technology schools in the country, we see the need to continue to improve and expand upon our existing facilities in order to recruit the top students and faculty. We are planning a capital campaign to help raise funds for needed projects and are looking forward to building on both old and new alliances in working together to meet our goals.

In closing, I am pleased to announce that the School of Mines has received the honor of being named one of America's 100 Best College Buys for the eighth consecutive year. We are one of only two institutions in South Dakota to make the list. More than 1,200 colleges across the country applied for the distinction.

We at the South Dakota School of Mines and Technology are excited to be a part of the growth and opportunities that lie ahead. Thank you for your support during this exciting time in our history.

Very truly yours,

Charles Ruch

# MAGAZINE

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY  
FALL 2005

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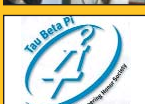
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### Hardrock Magazine Merge

*The South Dakota School of Mines and Technology Magazine and the Hardrock, published by the SDSM&T Alumni Association, will be merged into one publication scheduled for its first release in April 2006.*

*For more details see p. 18*

### 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

## 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, research, and education.

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

The School of Mines is a state supported university that provides graduate and undergraduate degrees in science and engineering.

### Fall 2005 Enrollment:

2,313 from 39 states and 20 countries

### Costs and Fees:

A School of Mines education has never been more affordable. Annual undergraduate costs for tuition, fees, books, room, and board total less than \$10,300 per year for South Dakota residents. A new initiative passed this year for Fall 2006 sets out-of-state tuition for first-time freshmen and transfer students at a uniform rate of 150 percent of in-state tuition rates, currently totaling less than \$11,450.

### Research:

Researchers conduct state-of-the-art research that benefits the state, the region, and the nation through advances in technology and economic development. In FY 2005, researchers received \$12.7 million in funding for approximately 100 projects. Funding agencies included the National Science Foundation, the State of South Dakota, NASA, the Department of Education, Army Research Laboratory, and many more.

### Faculty:

The School of Mines employs 159 full time faculty members. More than 90 percent hold doctorate or other appropriate terminal degrees.

### Honors and Awards:

- One of America's Best College Buys for the eighth consecutive year.
- One of approximately 215 Colleges of Distinction.

### Placement:

Average starting salary offers to our graduates: approximately \$48,000. More than 90 percent of 2004-2005 graduates placed in jobs in their career fields or graduate professional programs.

### 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  
Material Engineering and Science  
Nanoscience and Nanoengineering  
Biomedical Engineering



# Golden Nuggets



## School of Mines holds 151st commencement

The School of Mines held its 151st commencement May 7, 2005, and awarded degrees to more than 250 undergraduate and graduate students. In addition, 12 alumni from the class of 1955 attended the ceremony and received certificates commemorating their graduation.



**Class of 1955 front row from left:** Maurice C. Fuerstenau, GeoE; Berton R. Fedt, GeoE; John Duff Erickson, Mine; Daniel Dake, CE; Sonny A. Caputo, CE. **Back row from left:** Tom Zeller (ME '70), 2005 Alumni Association President; John R. Wilkinson, GenE; Jack E. Roadifer, GeoE; Kenneth Charles Parsons, ME; Dewayne L. Misterek, CE; Neil J. Isto, GenE; and Loren G. Henry, CE.

**Greg Graves** (ME '80) delivered the



*Commencement speaker Mr. Greg Graves (ME '80), Chief Executive Officer, Burns & McDonnell of Kansas City, Missouri*

commencement address. After graduating from the School of Mines, Graves joined Burns & McDonnell of Kansas City, Missouri.

Graves has held increasingly responsible positions within the company. As vice president and marketing director, he expanded the company's client

base by building relationships with potential partners and clients. In the late 1990s, he led the way in positioning the firm to take advantage of the power market.

Graves was promoted to general manager of the Energy Division in 1997, named energy group president in 2001, became president and chief operating officer in January 2003, and was named chief executive officer in October 2003.

**Miaken Zeigler** (EE '05) represented the



*Senior Class Representative Speaker Ms. Miaken Zeigler*

graduating class. Zeigler served as a resident assistant, member and chair of the Leadership Development Team, orientation leader and co-chair, and student program coordinator for the Student Activities and Leadership Center. Zeigler's talent and abilities on the Lady

Hardrocker's basketball team earned her three All Conference selections, 2nd Team All American honors, and the distinction of a three-time scholar-athlete.

The university also honored **Harold Fritzsche** (ME '51) with the Guy E. March Medal. Fritzsche, a World War II veteran, began his career in the General Engineering Training Program with General Electric (G.E.). After taking a leave of absence to enroll in graduate school at Purdue, Fritzsche earned a master's degree in Mechanical Engineering in 1956. Fritzsche continued in project engineering for G.E. in Fort Wayne, Indiana, and was promoted through various positions including manager of advanced engineering and program manager until his retirement in 1986.

During his career, he held 19 U.S. patents. Throughout his career away from South



*Guy E. March Medal Recipient  
Mr. Harold Fritzsche (ME '51)*

Dakota, he returned to campus frequently, while he consistently maintained regular contact and involvement in support of the university, its students and alumni. His support of Hardrocker athletics and many other endeavors continues.

### Five Days in '05

More than 1,500 School of Mines alumni, family, and friends from across the country and around the world returned to campus July 6-10 for the 2005 All-School Reunion, "Five Days in '05."

"We are delighted that so many School of Mines alumni visited campus for this fun event," School of Mines President Dr. Charles Ruch said. "A university is a community, and alumni are an important and integral part of the School of Mines community."

During Five Days in '05, alumni attended class socials, a family picnic in the Quad, golf, attended departmental, fraternity, sorority, and organizational open houses and banquets, climbed Harney Peak, and many more activities. The climax of the reunion was the setting of the reunion plaque on M-Hill on July 9. Many alumni climbed the hill to take part.

"This reunion was a chance for friends and classmates to see each other again, catch up on news since the last reunion, and reminisce about their School of Mines experiences," Ruch said.

This was the 12th All-School Reunion since 1950, following the first-ever summer Homecoming in 1946. The School of Mines Alumni Association coordinates the All-School Reunion with the help of many local alumni,



*Alumni joined together to form an "M" and pose for a photo during the Five Days in '05' All-Class Reunion.*

campus volunteers, and community members. For more information about the reunion, visit [www.hpcnet.org/reunion](http://www.hpcnet.org/reunion).

### School of Mines forms partnership with RESPEC

The South Dakota School of Mines and Technology and RESPEC have formed a partnership that will create new research and development opportunities.

"RESPEC and the School of Mines have unique resources," Tom Zeller, president of Rapid City-based RESPEC, said. "This agreement



*Mr. Tom Zeller (ME '70), president of Rapid City-based RESPEC and Dr. Charles Ruch sign the partnership agreement between School of Mines and RESPEC.*

will allow us to jointly pursue larger projects that will bring more research dollars into our community."



"We are pleased to enter this partnership with RESPEC," School of Mines President Dr. Charles Ruch said. "It will allow us to formally work together as partners on a variety of research projects."

RESPEC is an integrated consulting and services firm with approximately 110 full-time employees and annual revenue of nearly \$10 million. Since its founding in 1969, RESPEC has remained committed to its original purpose of providing clients with high-quality technical and advisory services. RESPEC currently has offices in Rapid City, South Dakota; Albuquerque and Carlsbad, New Mexico; Rochester, New York; and Esterhazy, Saskatchewan. For more information about RESPEC, visit <[www.respec.com](http://www.respec.com)>.

Both RESPEC and the School of Mines will be able to leverage the partnership when applying for research grants. Those projects could allow RESPEC to grow and will offer School of Mines students new opportunities to learn the skills future employers want and need. The projects also will help the two investigate new technologies and products.

"We are very excited to have the opportunity to work with important businesses and industry in our community to advance

science and technology," Ruch said.



*School of Mines President  
Dr. Charles Ruch.*

### President Ruch Appointed to Foundation Post

Following a nomination by Tom Daschle, former South Dakota Senator and Senate Minority Leader, President George W. Bush appointed South Dakota School of Mines

and Technology President **Dr. Charles Ruch** to a spot on the Board of Trustees of the Barry Goldwater Scholarship and Excellence in Education Foundation.

The Barry M. Goldwater Scholarship and Excellence in Education Program was

established by Congress in 1986 to honor Senator Barry M. Goldwater, who served the country for 56 years as a soldier and statesman, including 30 years of service in the U.S. Senate. The purpose of the foundation is to provide a continuing source of highly qualified scientists, mathematicians, and engineers by awarding scholarships to college students who intend to pursue careers in these fields.

Ruch will serve the remainder of a six-year term that expires August 11, 2010.

"I am honored that President Bush considers me qualified for this position," Ruch said. "The Barry M. Goldwater Scholarship and Excellence in Education Program recognizes the best and brightest of our nation's college students, and I am honored to be associated with it."

## HLC Accreditation Announcement



The South Dakota School of Mines invites comment from the public about the university in preparation for its periodic evaluation by its regional accrediting agency. The university will undergo a comprehensive evaluation visit March 27-29, 2006, by a team representing the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools. The South Dakota School of Mines has been accredited since 1925. The team will review the University's ongoing ability to meet the Commission's Criteria for Accreditation. To view the self-study report submitted by the university to the Commission, please go to <http://www.sdsmt.edu/selfstudy>.

The public is invited to submit comments regarding the University to:  
**Public Comment on the South Dakota School of Mines & Technology**  
The Higher Learning Commission  
30 North LaSalle Street, Suite 2400  
Chicago, IL 60602-2504

Comments can be submitted via an online form at <http://www.ncahlc.org/wrapped/thirdparty.php>. Comments must address substantive matters related to the quality of the institution or its academic programs. Comments must be accompanied by the name and contact information of the commentator and cannot be treated as confidential.

**All comments must be received by February 27, 2006.**

## ABET Accreditation

Congratulations to the engineering programs that were recently reaccredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET):

- **Chemical Engineering**
- **Civil Engineering**
- **Computer Engineering**
- **Electrical Engineering**
- **Geological Engineering**
- **Industrial Engineering**
- **Mechanical Engineering**
- **Metallurgical Engineering**

Mining Engineering and Management, as a new program, is currently not eligible for accreditation, but will apply when the program has its first graduate.

Environmental Engineering will be seeking accreditation.



# REU Program

## Undergraduate research program gives students hands-on experience

The School of Mines is the site of two Research Experiences for Undergraduates (REU) programs. REU is funded by the National Science Foundation (NSF) to provide opportunities for undergraduates to participate in active research.

REU began out of the NSF's desire to assist in developing a pipeline of students that would go on to earn graduate degrees. The NSF decided that in order for this to happen, undergraduates should have the opportunity to experience research; They developed the program, provided funding, and REU was born.

The program has a focus on providing these opportunities to under-represented student populations, such as American Indians and women. Each site accepts 10 students every summer.

The first REU site on the School of Mines campus began in 1998. The program, "Advanced Materials and Biochemical Engineering," is centered on chemical engineering and has several goals: **1.** To provide undergraduates of chemical engineering or allied fields with unique and exciting research opportunities in the area of molecular level modification of surfaces utilizing state-of-the-art research equipment; **2.** To enhance the participants' critical thinking and communication skills; **3.** To spark the participants' interest in pursuing graduate education; **4.** To introduce the participants to "beyond the classroom" experience in a research setting; and **5.** To enhance the participants' ability to think independently.

"REU is a way to develop another set of skills that undergraduates don't normally have access to. It's a very unique opportunity where students learn their fields by doing cutting-edge research," Dr. Robb Winter, site director and chair and professor, Chemical and Biological Engineering Department, said. "One of the best ways for students to make choices about their futures intelligently is to have experience in the kind of work that they are interested in."

This site has evolved from running solely on

the School of Mines campus to having an international component. Several years ago, the NSF was interested in giving undergraduate research associates experience internationally, because they were concerned with American engineering students having a lack of international experience.



*REU students conduct research with real-life implications. Pictured above: REU participant junior Lizabeth Nielsen (ME, Howard), researched exfoliation of nanoscale aluminosilicates powder.*

Winter, chair of the Chemical and Biological Engineering Department, applied for a supplemental grant that funded a sister site at the Mongolian University of Science and Technology in Ulaanbaatar, Mongolia. Three students have studied in Mongolia for the past two years. According to Winter, plans for another site in China are in the works.

The second REU site on campus, "Materials, Mechanics and Manufacturing (3M)," is new this year. Led by site director Dr. Lidvin Kjerengtroen, a professor in the Mechanical Engineering Department, and other senior faculty members, the site focuses on cutting-edge research in materials, mechanics, and manufacturing.

The main objective of the 3M site is to increase the number of students who enter graduate programs. Another objective is to increase student abilities and make them competitive in a research environment by fostering team building skills, technical

**REU Program** *continued on p. 18*

# A Bright Future

## School of Mines graduates look to positive career beginnings



With reports of an uncertain national economy and unemployment rates hovering at uncomfortable levels, many new graduates have their work cut out for them when they start their job search. Luckily, that is not the case for graduates of the South Dakota School of Mines and Technology.

According to Darrell Sawyer, director of Career Planning and Placement for the School of Mines, demand is consistently strong across the board for all of the university's majors. "Many of our majors don't show up on the "hot jobs" lists of projected growth, but that's because there is always consistent demand for science and engineering graduates," Sawyer said.

This demand comes despite ups and downs in the United States economy. In light of the tech bubble burst of a few years ago, there was a dip in the demand for computer science and engineering graduates. This trend has made a complete turn-around according to Sawyer, and the demand will continue to increase in the next few years. In fact, last year's computer science graduates from the School of Mines received average salary offers of more than \$55,000, nearly \$8,000 more than the national average.

These high salary offers aren't isolated to just computer science graduates. The average salary offer for a graduate of the School of Mines is nearly \$48,000, with engineering majors at more than \$47,000 and science majors at more than \$50,000.

However, salaries don't tell the whole story. Last year's graduates from the School of Mines have achieved a more than 90 percent

placement rate in their field or in a graduate program, less than six months after graduation. By the middle of July, less than three months after graduation, civil engineering students had reached 100 percent placement.

"The economy has picked up, but regardless, the demand for scientists and engineering will always be strong," Sawyer said. "In terms of options, our students often have three, four, even five job offers to choose from. That's a good problem to have."

The School of Mines' strong internship and co-op programs help to drive the high placements and salaries. With more than 76

percent of graduates leaving with relevant work experience through an internship or co-op, School of Mines graduates are presented as already tried-and-true employees.

According to Sawyer, many companies, such as Cargill, Rockwell Collins, and Caterpillar, view interns and co-op

students as their hiring pool, making job offers to nearly 80 percent of them. For many students, this means that they will have a job offer by the time they are starting their senior year.

The job outlook for School of Mines graduates continues to look bright. One indication of this is the number of employers visiting campus. According to Sawyer, it is important that companies are making that commitment.

"For companies to come here, they spend a fair amount of time and resources. The

“In terms of options, our students often have three, four, even five job offers to choose from. That's a good problem to have.”

**Darrell Sawyer**

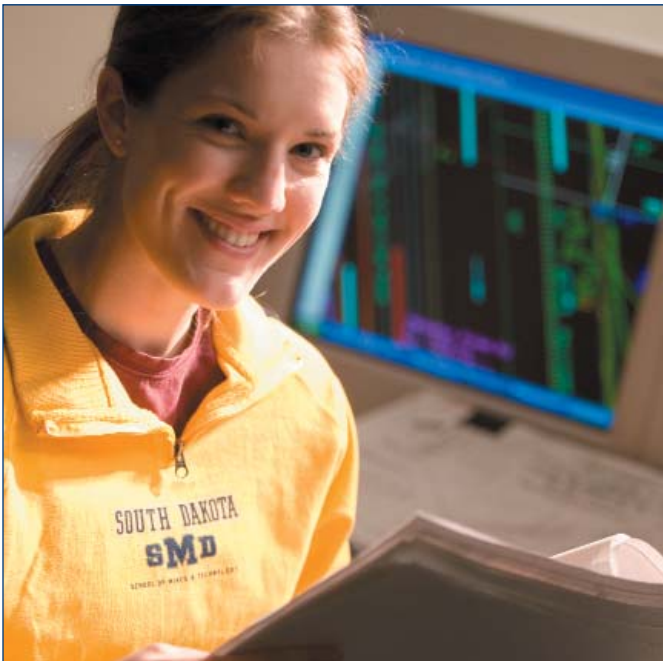
Director,  
Career Planning, Placement,  
and Cooperative Education





CAMP projects such as the Mini Indy foster teamwork and leadership skills that are important to many employers of School of Mines graduates.

trend in the past few years is that companies are scaling back the number of schools that they visit and recruit from because of cost,” Sawyer said. “Despite this, and the fact that we are far away for many companies, they continue to show a demand and interest in



“Internships have helped me prepare for my career as a civil engineer by giving me hands-on experience. You can only learn so much in a classroom before you need something to bring it all together, and internships have really done that for me.”

**Brandy Pelton**  
Civil Engineering  
Killdeer, N.D.



“I’ve always loved building things. Coming to the School of Mines has allowed me to use the latest technology to develop new products and new innovations. I’m living my dream. Every day I get to see how things work, and improve them.”

**Tony Amert**  
Electrical Engineering  
Direct Write Lab team member  
Madison, S.D.

our students by visiting and recruiting here.”

According to Sawyer, one reason that companies continue to visit the School of Mines campus is that they have had success with alumni currently working for them. Another attractive feature to employers is the amount of hands-on experience that students receive on the campus.

“Our curriculum here is important to many employers — the projects that our students do, whether it’s senior design, CAMP projects or any student competitions,” Sawyer said, “students can’t help but get involved here, and that’s something employers look for.”

More than 100 companies visit the campus annually, with 77 visiting for the Fall 2005 Career Fair alone. With companies coming to campus in ever-increasing numbers, it’s safe to say that School of Mines graduates have a bright future ahead.



# Soaring to New Heights

## Aero Design team takes first place in international competition



In just its fifth year of competition, the South Dakota School of Mines and Technology captured first place in the Aero Design West remote-controlled airplane competition in Fort Worth, Texas.

“This is like winning the NCAA championship.”

**Dr. Dan Dolan**

Professor, Department of Mechanical Engineering and Co-Director, Center of Excellence for Advanced Manufacturing and Production (CAMP)

The Aero Design competition is intended to provide undergraduate and graduate engineering students with a real-life engineering exercise. The competition has been designed to provide exposure to the kinds of situations that engineers face in the real work environment.

“This is like winning the NCAA championship” team advisor Dr. Dan Dolan said. “This is absolutely awesome. It’s truly something special.”

The School of Mines team spent months designing, building, and testing the remote-controlled biplane that features a 5-foot wingspan. At the competition, the plane carried 19 pounds of added lead weight, the most of any of the nearly 40 teams, and placed third in design.

On the first flight day, conditions were rough and the main plane went down. The students had to salvage and repair the plane with parts from their spare. According to Dolan, the team was well organized and prepared so that this seeming disaster did not remove them from the running.

When the judges tallied the total scores, the School of Mines finished atop the regular class and ahead of some of the best-known

universities in the world. The School of Mines team also brought home the best overall and the best team overall awards and the traveling trophy that will remain on campus for the next year.

“We build a team, and they build upon the technical aspects they are given at this school,” Dolan said. “That’s the combination that allowed us to win these awards.”

Dolan credited the team’s success, in part, to the Center of Excellence for Advanced Manufacturing and Production, also known as CAMP. Competition teams such as Aero Design fall under CAMP, a program that uses teams to offer an innovative engineering and science education and teach team-building and other skills students need and future employers want.



*Aero Design team members sacrificed many hours designing, building, and testing what would be a winning machine.*

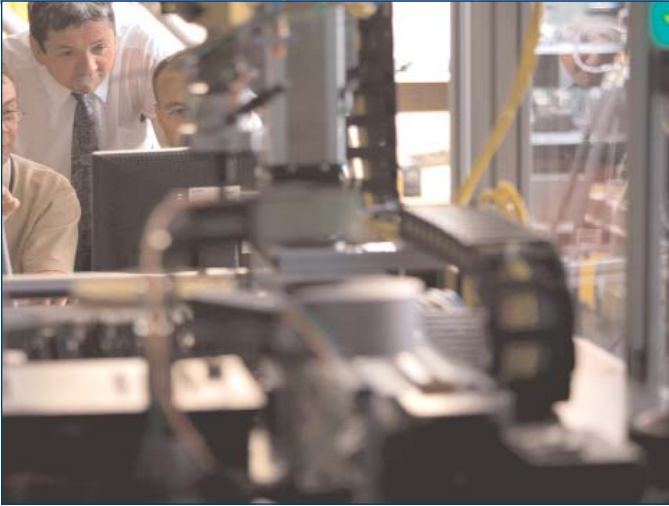
“This was a typical good CAMP team,” Dolan said. “They really put everything together. Every student had a task and every student fulfilled those tasks flawlessly. The Aero Design team members really put their trust in each other. Everyone was willing to voice their opinions and when they had a problem, they worked through it until they reached a consensus. Every student felt like they belonged on the team.”





# Entrepreneurship in the Classroom

## New programs give students valuable experience



*At the School of Mines, faculty, researchers, and students collaborate on many entrepreneurial ventures. Pictured above: Dr. Kalanovich and Control Systems Technologies machinery.*

The entrepreneurship climate on both the School of Mines campus and throughout Black Hills area communities has never been so kind to students.

Would-be student entrepreneurs have more opportunities than ever before to turn their dreams into reality.

At the School of Mines, entrepreneurship begins in the classroom. Through the educational process, students are brought into the world of entrepreneurship.

In one of these courses, Mechanical Engineering 262, students behave as companies for the semester. They are divided into groups, where they come up with a product. They then start a patent search and pursue the basic elements that are needed for company success, such as manufacturing, design and business, and financial and marketing plans.

"These students evolve throughout the semester to the stage that, if they wish, after the semester they are ready to pursue an investor group," Dr. Vojislav Kalanovic, chair and professor of the Mechanical Engineering Department, said.

Kalanovic, an entrepreneur himself, has a company that is associated with the school, Control Systems Technologies. Kalanovic

believes that faculty efforts like these can also benefit the students. By providing faculty with entrepreneurship experiences, they can pass this knowledge to students to help foster their own entrepreneurship future.

"This would provide students the opportunity to work on projects at both graduate and undergraduate levels," said Kalanovic. "This opens up an opportunity for students and faculty to have their entrepreneurial dreams come true."

Once students have a grounding in entrepreneurship education, they can put their knowledge in action during a senior design project.

**“This would provide students the opportunity to work on projects at both graduate and undergraduate levels... ”**

**Dr. Vojislav Kalanovic**  
Professor and Chair,  
Mechanical Engineering Department

According to Dr. Dale Skillman, an assistant professor in the Mechanical Engineering Department and a Small Business Innovation Research Coordinator, senior design is a way for students to enter the entrepreneurship world.

One way for students to do so is to partner with an outside business. In the past, senior design projects have been a vehicle for companies to accomplish some of their business development.

"This facilitates educational opportunities for students as they work on real industrial projects," said Skillman. "These are real companies that are in business that need something done, and they come to the School of Mines to have a senior design team spend a couple hundred engineering man hours on their project."





## Featured Major

### Chemical Engineering



- Excellent starting salaries
- Exceptional research opportunities
- Program scholarships available

Chemical engineers with a B.S. degree from School of Mines will obtain a solid foundation for their engineering degree in the science of chemistry, in mathematics, and in applied technology. Chemical engineers are able to help solve the problems affecting the people of the world and to efficiently use the world's resources. The Chemical Engineering program is designed to prepare students to become practicing chemical engineers, ready to enter the workforce and make immediate contributions.

Learn more about the Chemical Engineering program at <http://cbe.sdsmt.edu>.

#### A sample of recent employers of our Chemical Engineering graduates include:

- Cargill
- Broin
- Dow Chemical
- Tate and Lyle
- South Dakota Department of Natural Resources
- ... and many more



## Curriculum...to Careers!



### Co-ops and Internships

- More than 76 percent of School of Mines graduates have relevant work experience through co-ops and internships. That increases their marketability to employers.

### Planning Your Career

- The School of Mines 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

- 2004-2005 graduates averaged starting salary offers of more than \$48,000! That shows employers are looking for students with the kinds of skills School of Mines graduates have.



# Tau Beta Pi Scholars

## School of Mines leads the nation in scholars



Six South Dakota School of Mines and Technology students have been named Tau Beta Pi Scholars for the 2005-2006 academic year. No other university had as many students selected, with the next highest receiving three. Each student will receive a \$2,000 scholarship.

“

A student becoming involved in Tau Beta Pi is also an opportunity to become actively involved and take on leadership roles.”

**Dr. Larry Simonson**

William J. Hoffert Professor,  
Department of Electrical Engineering

“This is an outstanding achievement for these students and for our university,” School of Mines President Dr. Charles Ruch said. “The selection of these students recognizes their outstanding achievements and abilities and the quality education the School of Mines delivers.”

From 180 applicants, Tau Beta Pi’s Fellowship Board selected 69 scholars, the largest number of scholarships awarded in one year since the program was established in 1998. All Tau Beta Pi Scholarships are awarded on the competitive criteria of high scholarship, campus leadership and service, and promise of future contributions to the engineering profession. All scholars are members of Tau Beta Pi, the engineering honor society.



“A student becoming involved in Tau Beta Pi is recognition of their academic achievements. As a benefit of their participation, there are opportunities for scholarships and fellowships,” said Dr. Larry Simonson, chief advisor for the School

of Mines chapter and district director. “It’s also

an opportunity to become actively involved and take on leadership roles.”

Tau Beta Pi is the only engineering honor society representing the entire engineering profession. It is the nation’s second-oldest honor society, founded at Lehigh University in 1885 to recognize students of distinguished scholarship and exemplary character.

Its members are selected from the upper eighth of juniors and the upper fifth of seniors majoring in engineering. There are now collegiate chapters at 229 U.S. colleges and universities, active alumni chapters in 16 districts across the country, and a total initiated membership of 474,629, making it the largest engineering society in the world.

The students: Justin Kasemodel, Electrical Engineering, Sioux Falls; Bobbie Crater, Mechanical Engineering, Glasgow, Mont.; John Brosnahan, Civil Engineering, Lead; Deborah Carlson, Metallurgical Engineering, Rochester, Minn.; Daniel Hammarsten, Chemical Engineering, Ashley, N.D.; and Jennifer Pazour, Industrial Engineering, Pukwana.



*Students involved in Tau Beta Pi also serve the larger community through service projects.*



# School of Mines *Reaching Out*



Members of Tau Beta Pi participated in a service project where they refurbished bicycles to be distributed to underprivileged children.



The School of Mines campus welcomed a residential camp, "Socket to Me: Computer to Me." During their time on campus, the girls learned Basic programming, Web programming, and more.



Todd County and Saint Francis High School students participating in Sinte Gleska University's GEAR-UP Program attended the School of Mines' RoboCamp, where they programmed Parallax Boe-Bots to navigate through a maze using dead-reckoning and integrated the use of bump sensors.



The Black Hills Business Development Center broke ground for a 10,000-square-foot building, located on the south side of the campus. The rest of the building can be rented to private agencies. The business incubator has an estimated cost of \$1.5 million.



# of Mines Reaching Out



and middle-school girls for a week-long "Computer Science and Engineering for Girls." They learned about PC maintenance, Virtual Reality, basic electronics, and more.



ground on campus in Summer 2005. The 40,000-sq-ft campus, will be home to several government and industry offices, and will be modified to suit the needs of entrepreneurs who are expected to move in by the completion date of Spring 2006.



During the United Way Day of Caring, a team of staff and students from the School of Mines cleared brush, branches, and trash from Rapid Creek by the Central States Fairgrounds.



During summer 2005, high school students arrived on campus to participate in the fifth year of the Youth Engineering Adventure, during which they participated in hands-on engineering and design projects, tours of engineering, industry, and technology firms, and teamwork and leadership opportunities.

# M<sup>3</sup>D Research

## New research puts the School of Mines at the forefront of technology

Cutting-edge research at the School of Mines is opening the avenue for new economic development opportunities. The university's Maskless Mesoscale Material Deposition, or M<sup>3</sup>D, machine is helping make this possible.

The M<sup>3</sup>D machine, located in Tech Development Lab's Direct Write Laboratory, was purchased and acquired by the school in August 2004. The United States Army Research Laboratory is the entity that funds the Direct Write Lab, at \$1.5 million for two years. With this funding, the School of Mines is also acquiring two other direct write machines — nScript and Ink Jet. When these are installed, the School of Mines will house the three main direct write technologies, and will be the only laboratory to do so.

Special thanks go to the South Dakota Congressional delegation. Without their support, securing funding for this project would not have been possible.

According to Dr. Keith Whites, professor and Steven P. Miller Chair, Department of Electrical and Computer Engineering, and the grant's co-P.I., the M<sup>3</sup>D machine's main function is to deposit metal inks and other material types onto low-temperature substrates and to create electronic circuits. The machine

can print at very small sizes — easily 25 microns, which is a third of the width of a human hair.

"The device is low temperature, so we print a lot of the devices we make onto plastic. And then because the plastic is flexible, we are able to print electromagnetic devices, antennas, and microwave circuits onto flexible plastic sheets, and that allows us to make devices and use them in applications where they couldn't be used before," Dr. Whites said. "For example, for the flexible antennas, you could make conformal and wearable antennas, which is one

of the projects that we have with the Army."

According to Dr. Whites, something very important to the success of the M<sup>3</sup>D applications is the campus-wide collaborations that it generates. Dr. James Sears, Director, Additive Manufacturing Laboratory (AML), serves as the other Co - P.I. with Dr. Whites on

the Army Research Laboratory contract. Dr. Shawn Decker, director, Center for Accelerated Applications at the Nanoscale; Dr. Ken Han, dean, Graduate Education and Distinguished and Fuerstenau professor, Department of Materials and Metallurgical Engineering; Dr. Jon Kellar, chair and professor Department of



*Collaboration between faculty, researchers, and students is an important component to the success of the M<sup>3</sup>D research, and the campus as a whole.*





*Student involvement is an integral part of the M<sup>3</sup>D research. Students serve on the ink development team and in other research areas.*

Materials and Metallurgical Engineering; Dr. Nam-Soo (Peter) Kim, research scientist I, Center for Accelerated Applications at the Nanoscale; and Dr. Whites have formed one such collaboration in the ink development team. This team also has had student involvement.

According to Dr. Kellar, these inks are not traditional inks, but rather inks based on nanoscale metals and other particles that can be deposited with the M<sup>3</sup>D machine.

“We are currently working on proposals that involve ‘photo active’ inks,” Dr. Kellar said. “In other words, we envision being able to create inks that become activated by light. For example, one type of ink that is desired is metallic silver. We would like to develop inks that form the metal when exposed to light.”

According to Dr. Whites, having an interdisciplinary collaboration such as the ink development team is very important to the research process.

“This doesn’t happen very often — all of these disciplines coming together into one project. At larger universities, it’s not uncommon to see researchers in the same department working together. Across departments — that’s virtually unheard of,” Dr. Whites said. “I think that’s what it takes today to make large strides into new technology. The days of the single researcher working alone in an area are over.”

According to Dr. Whites, by working together across disciplines, the School of Mines has the opportunity to develop new and promising technology that will contribute to regional economic development.

“It’s extraordinary. This is how you can actually make new technology,” Dr. Whites said. “Technology is the application of knowledge, and I think that is something that we do very well here.”

The research that is being done with the M<sup>3</sup>D machine is generating new intellectual property, such as ink formulas, which are proprietary. With new and exciting research, the path to new economic development ventures begins to open up.

“I think that there is a real potential for new commercial inks and electronic devices because of the research we are doing,” Dr. Kellar said.

In fact, the opportunity to help with regional economic development was one of the things that brought Dr. Whites back to the School of Mines in 2001.

“South Dakota’s impact on the national economy is negligible. South Dakota — we’re not trendsetters, generally,” Dr. Whites said. “But this research is trendsetting, it really is.”





# Student Spotlight

## Students participate in math modeling contest

Six School of Mines students put their math modeling skills to the test when they competed in the 21st annual Mathematical Contest in Modeling. In the contest, teams of three undergraduate students were given open-ended complex problems. The teams needed to research the topic, develop a mathematical model, use a computer to simulate the model, and write a technical report. The teams completed the task in one weekend.

Team 1 earned a successful participant and Team 2 earned an honorable mention. Honorable mention places a team in approximately the top half of the competition, which involves over 600 teams from around the world.

**Team 1:** Aaron Geier (Math and CSc, Watertown), Kristen Bartelt (ChE, Watertown), and Adam Grajkowski (Math and CSc, Parkston)

**Team 2:** Benjamin Cutler (Math and CSc, Hot Springs), Benjamin Edwards (Math and CompE, Casper, Wyo.), and Daniel Rausch (Math and CSc, Ortonville, Minn.)

## Homecoming 2005

Jen Pazour, an Industrial Engineering major



from Pukwana, was elected Homecoming Queen, and Clark Wismer, an Electrical Engineering major from Britton, was elected Homecoming King during an M-Week ceremony held at the School of Mines.

The royalty, selected by students, presided over the M-Week parade and the Homecoming football game Saturday, Sept. 17.

The other Homecoming candidates were:

**King:** David Burnett, (IE, Philip), Zac Doorenbos, (ChE, Owatonna, Minn.) Bob Hodgson, (IE, Lemmon), Tim Lystad, (IE, Stanley, N.D.)

**Queen:** Jessica Elsen, (IS, Hecla, S.D.), Quinn Godecke, (IS, Dillon, Mont.), Cori Leis, (IE, Rapid City), Brandy Pelton, (CE, Killdeer, N.D.)



*At the President's Picnic during Welcome Week 2005, the freshman class gathered to form an "M", continuing a new tradition begun by alumni during the Five Days in '05 All-Class Reunion.*

## New Freshmen Class Senators Elected

After an online election, five freshman class senators were elected this fall to serve one-year terms.

The senators are: **Melanie Jeppesen**, president (IS, Pleasant Dale, Neb.), serving as chair of the Public Relations Committee; **Matt Booth** (CE, Rapid City), serving on the Constitution Committee; **James Kenney** (ME, Rapid City), serving on the Public Relations Committee; **Jon Larsen** (EE, Frederick), serving on the Student Affairs Committee; and **Sean Hayes** (ME, Boise, Idaho), serving on the Finance Committee.

## Student Receives Top Honors

**Elizabeth Burg**, a senior Civil Engineering student, was recognized for her technical paper, "Analytical Parametric Study on Horizontal Loading Capacity of Suction Piles."



This paper was one of 24 selected internationally to be presented at the 2005 Marine

Technology Society/IEEE OCEANS 2005 Conference in Washington, D.C. After judging by the Office of Naval Research, Burg's paper received third place.

Burg's paper was based on work done with Dr. Sangchul Bang, professor, department of Civil and Environmental Engineering, during the summer 2005 Research Experience for Undergraduates (REU).



# Campus Briefings

## Business incubator breaks ground

A new facility on the School of Mines campus will help area entrepreneurs turn their ideas into reality.



The Black Hills Business Development Center, a 40,000-square-foot building located on the south side of campus, will be home to several government and private agencies, including the West River Business Service Center, the Rapid City Economic Development Partnership, Service Corps of Retired Executives (SCORE), and Genesis Equity Fund.

The rest of the building will be open space that can be modified to meet the needs of entrepreneurs. They can rent space in the incubator while developing designs and prototypes, testing products, conducting market research, creating marketing materials, and searching for capital. Entrepreneurs will also have access to the business development groups located in the incubator.

After spending a limited number of years in the incubator, entrepreneurs should have a viable product or service and a strong business plan ready to enter the marketplace.

The location on campus will also provide faculty and students access to the incubator to explore commercial potential for ideas produced during research, and independent entrepreneurs can utilize the university's technical expertise.

The Business Development Center is expected to be completed in Spring 2006.

## School of Mines announces Hall of Fame inductees

The School of Mines Hardrock Club and Athletic Department inducted nine individuals and one team into the Athletic Hall of Fame during a ceremony on campus. They were also

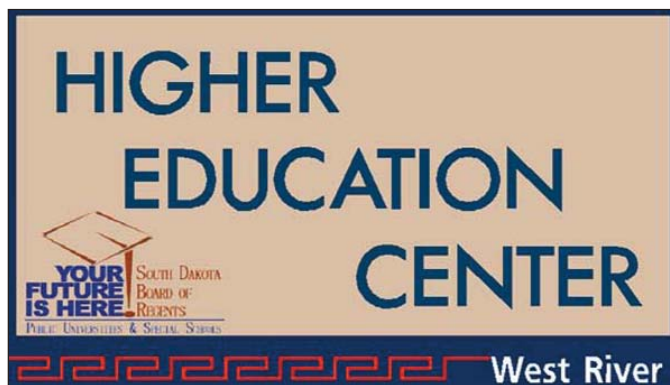
recognized at halftime during the Homecoming football game. This was the second year of inductions. Twenty-seven individuals and two teams have been honored in the Hall of Fame.

The nine individuals included: Football: **Bob Longbons** (GeolE '80) and **Dave Dutton**; Basketball: **Jim Meyers** (ChE '55); Women's Basketball: **Jane Barnes** (ChE '79); Volleyball: **Jill Thompson Schauer** (ChE '90); Track and Cross Country: **Bruce Sabacky** (Met '73); Golf: **Ralph Wagner** (ChE '75), All Around Athlete: **Randy Beck** (MinE '77); Coach: **Jim Kampen** (BB); and Builder: **Verne Sheppard** (covered the School of Mines on KOTA Radio beginning in 1957).

The team inducted into the Hall of Fame was the 1980 Hardrocker football team that finished 8-1 and set the modern record for fewest points allowed in a season.

## Higher Education Center opens doors

West River residents who want to pursue their higher education goals now have an easy, efficient way to find the information they need, thanks to the Higher Education Center — West River.



The Higher Education Center — West River was established to provide a "one-stop shop" for all West River area students considering enrolling in higher educational programs at the undergraduate and graduate level. Some courses and programs are taught at the center.

The purpose of the center is to provide a cooperative and collaborative effort from the participating universities — Black Hills State, School of Mines, University of South Dakota, and South Dakota State University — to meet the needs of students, especially the large population base in western South Dakota.

The center is striving to be responsive to the needs of residents in the entire West River region. One of the first tasks for the center will be assessing what those needs are and



## Campus Briefings *continued*

formulating a plan to meet them. The center is conducting market research to find out what programs are needed and what needs are currently not being met.

The center will work as a clearinghouse to avoid duplicate coursework and facilitate a plan to share professors for courses offered by separate universities. The Center's location

near downtown Rapid City includes more than a dozen offices and a large classroom and houses representatives from several universities.

The center is under the direction of a consortium composed of BHSU President Dr. Thomas Flickema and School of Mines President Dr. Charles Ruch as well as Dr. Tad Perry, Executive Director of the South Dakota Board of Regents.



## REU Program *continued from p. 5*

communication, ethics, and overall research acumen.

As part of the graduate education goal, one of the students' responsibilities was to research the process of applying to graduate schools. Each student had to explore two schools: the School of Mines and another of their choice.

"This experience prepares students for the future," Dr. Kjerengtroen said. "They will leave the program with increased technical and professional skills."



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## It's Coming . . . April 2006

# THE HARDROCK™



The South Dakota School of Mines and Technology Magazine and the Hardrock, published by the SDSM&T Alumni Association, will be merged into one publication scheduled for its first release in April 2006.

If you are interested in receiving a copy of the new publication, please call (605) 394-2554. If you are interested in advertising opportunities, please call (605) 394-6081.



# Research Notes

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.

In the 2005 fiscal year, School of Mines researchers received more than \$12.7 million in sponsored research and development funding, an increase of almost a million dollars over the previous year.

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 Patniak**, assistant professor, Department of Civil and Environmental Engineering, received \$89,000 from the Friction Stir Processing Industry/University Cooperative Research Center Memberships for the project, "Design, Analysis, and Performance of 'Built-Up' Aluminum Friction Stir Welded (FSW) and Friction Stir Spot Welded (FSSW) Structures." **Mr. Arbegast** and **Dr. Patniak** also received \$6,000 in additional funding from the National Science Foundation for the project, "Friction Stir Processing Industry/University Cooperative Research Center."

**Mr. Arbegast** and **Dr. Edward Corwin**, professor, Department of Mathematics and Computer Science, received \$51,000 from the Friction Stir Processing Industry/University Cooperative Research Center Memberships and National Science Foundation for the project, "Intelligent Process Control System Algorithms for Aluminum and Steel Friction Stir Welding." **Mr. Arbegast** also received \$35,000 from the Friction Stir Processing Industry/University Cooperative Research Center Memberships for the project, "Creation of FSW/P Database and Process Parameter Correlations Development."

**Mr. Arbegast** and **Mr. Casey Allen**, research scientist II, Advanced Materials Processing and Joining Laboratory, received \$7,500 from Battelle — Pacific Northwest National Laboratory for the project, "Friction Stir Welding of Thin Aluminum Sheets."

**Dr. Sookie Bang**, professor, Department of Chemical and Biological Engineering, and **Dr. Venekataswamy Ramakrishnan**, distinguished professor emeritus, Department of Civil and Environmental Engineering, received \$53,273 in additional funding from the National Science Foundation for the project, "Performance of Microbiologically Enhanced Concrete Structural Elements."

**Dr. Gale Bishop**, professor, Department of Geology and Geological Engineering, received \$61,143 from the Standing Rock Sioux Tribe (Prime: United States Department of the Interior) for the project,

"Evaluation of the Paleontological Resource of Standing Rock Sioux Nation." **Dr. Bishop** also received \$3,000 in additional funding from Georgia Southern University (Prime: United States Department of Education) for the project, "2004-2005 St. Catherine's Sea Turtle Assistantship."

**Dr. David Boyles**, professor, Department of Chemistry, received \$463,000 from the United States Department of Defense — Air Force Research Laboratory for the project, "Lightweight and Novel Structures for Space." **Dr. Boyles** also received \$341,346 from the Defense Experimental Program to Stimulate Competitive Research (DEPSCoR) for the project, "Design and Synthesis of High Aspect Ratio Polycarbonates for Transparent Armor Applications."

**Dr. Gregory Buck**, associate professor, Department of Mechanical Engineering, received \$24,588 from the South Dakota Board of Regents for the project, "Governor's 2010 Individual Research Seed Grant Award."

**Dr. Li Chen**, assistant professor, Department of Electrical and Computer Engineering, received \$22,349 from the South Dakota Board of Regents for the project, "Governor's 2010 Individual Research Seed Grant Award."

**Dr. Arden Davis**, chair and Mickelson Professor, Department of Geology and Geological Engineering, and **Dr. David Dixon**, professor, Department of Chemical and Biological Engineering, received \$10,897 from South Dakota State University for the project, "Development of an Agglomeration Process to Increase the Efficiency of Limestone-Based Material to Remove Metals from Drinking Water."

**Dr. Arden Davis** also received \$4,500 from the United States Department of Interior — Bureau of Land Management for the project, "Conduct Studies of Inactive/Abandoned Mine Sites on BLM Administered Lands." In addition, **Dr. Arden Davis** received \$8,800 from the United States Department of Interior — National Park Service for the project, "Jewel Cave National Monument/Jewel Cave Pumping Test."

**Dr. Shawn Decker**, director, Center for Accelerated Applications at the Nanoscale (CAAN), received \$250,000 from the South Dakota Department of Tourism and State Development for the project, "Zyvex IC-FA." **Dr. Decker** also received \$585,000 in additional funding from the South Dakota Board of Regents for the project, "Center for Accelerated Applications at the Nanoscale — Year Two."



## Research Notes *continued*

**Dr. Andrew Detwiler**, chair and professor, and **Ms. Donna Kliche**, Research Scientist II, Department of Atmospheric Sciences, received \$150,982 from the National Science Foundation for the project, "Collaborative Research: Creation of an Online Archive of Airborne Storm Penetration." **Dr. Detwiler** also received \$20,000 from the South Dakota Board of Regents for the project, "EPSCoR Matching for Faculty Start-Up Packages & NSF PFI STEP Program."

**Dr. David Dixon**, professor, and **Dr. Patrick Gilcrease**, assistant professor, Department of Chemical and Biological Engineering, received \$16,807 in additional funding 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."

**Dr. Edward Duke**, manager of analytical services, Engineering and Mining Experiment Station, and professor, Department of Geology and Geological Engineering, received \$173,187 from NASA for the project, "South Dakota Space Grant Consortium."



**Dr. Duke** and **Dr. Colin Paterson**, director, Black Hills Natural Sciences Field Station, and professor, Department of Geology and Geological Engineering, received \$7,226 from the National Science Foundation for the project, "U.S.—Namibia Dissertation Enhancement: Application of Visible and Near-infrared Spectroscopic Methods to Identify Zonation of Hydrothermal Mineralization at Navachab Gold Deposit."

**Dr. Hao Fong**, assistant professor, Department of Chemistry, received \$65,650 from the National Institutes of Health for the project, "Dental Composite Resins with Polymer Nanofibers." **Dr. Fong** also received \$17,174 from the South Dakota Board of Regents for the project, "Governor's 2010 Individual Research Seed Grant Award."

**Dr. Kenneth Han**, associate dean, Department of Graduate Education and Sponsored Programs, distinguished and Fuerstenau professor, Department of Materials and Metallurgical Engineering, received \$45,458 from Barrick Gold Corporation for the project, "Efficient Recovery of Precious Metals Using Ammonia Leaching from Barrick Ore." **Dr. Han** also received \$50,000 from the South Dakota Board of Regents for the project "EPSCoR Matching for Faculty Start-Up Packages and NSF PFI STEP Program."



**Dr. John Helsdon**, professor, Institute of Atmospheric Sciences, received \$103,400 from the National Science Foundation for the project, Numerical Studies of Thunderstorm Electrification, Maxwell Currents, and Lightning."

**Ms. Carrie Herbel**, museum and collections manager, Museum of Geology, and **Dr. James Martin**, professor emeritus, Department of Geology and Geological Engineering, received \$6,000 from the United States Department of the Interior — Bureau of Reclamation for the project, "Paleontological survey and site documentation on Bureau of Reclamation land at Belle Fourche Reservoir in Butte County, South Dakota." **Ms. Herbel** also received \$40,000 from the United States Department of Interior — National Park Service for the project, "Provide Quality Paleontological Educational Experience at Pig Dig (2005 Field Season and part of lab preparation for 2005/2006)," and \$24,454 from the United States Department of Interior — National Park Service for the project, "Documentation of Significant Paleontological Localities with the Poleslide Member, Brule Formation, Badlands National Park."



**Dr. Mark Hjelmfelt**, chair, Department of Atmospheric Sciences, professor, Institute of Atmospheric Sciences, received \$136,618 from the National Science Foundation for the project, "Collaborative Research: Effects of Non-Uniform Surface Conditions on Lake-Effect Systems."

**Dr. Jon Kellar**, professor, Department of Materials and Metallurgical Engineering, received \$212,500 from the United States Department of Defense — Air Force Research Laboratory for the project, "Lightweight and Novel Structures for Space."

**Dr. Jon Kellar**, **Dr. Jan Puszynski**, Department of Chemical and Biological Engineering, **Dr. Edward Duke**, manager of analytical services, Engineering and Mining Experiment Station, and professor, Department of Geology and Geological Engineering, and **Dr. Sookie Bang**, professor, Department of Chemical and Biological Engineering, received \$554,867 from the National Science Foundation for the project, "Acquisition of a Field Emission Scanning Electron Microscope."



**Dr. Scott Kenner**, chair and associate professor, Department of Civil and Environmental Engineering, received \$178,223 from the South Dakota Department of Environment and Natural Resources and United States Environmental Protection Agency for the project, "Cheyenne River Phase I TMDL Assessment Project." **Dr. Kenner** also received \$70,000 from RESPEC for the project "Belle Fourche River Watershed Management and Project Plan Segment II - 319 Watershed Project," and \$11,710 from the United States Department of Agriculture - Forest Service — Black Hills National Forest for the project, "NRIS-Water Data Entry."

**Dr. Carter Kerk**, associate professor, Department of Industrial Engineering, received \$50,000 from Salish Kootenai College (Prime: National Science Foundation) for the project, "The



## Research Notes *continued*

Louis Stokes All Nations Alliance for Minority Participation."

**Dr. Lidvin Kjerengtroen**, professor, Department of Mechanical Engineering, received \$290,000 from the National Science Foundation for the project, "Materials, Mechanics, and Manufacturing."

**Dr. Alvis Lisenbee**, professor, Department of Geology and Geological Engineering, received \$9,162 from the West Dakota Water Development District for the project, "Determination of Historic Ground Water Pollution Problems, Part II: Pactola Dam, Rapid City West, and the North One-half of Rockerville Quadrangles." **Dr. Lisenbee** also received \$9,112 from the West Dakota Water Development District for the project, "Aquifer Susceptibility Study of the Pactola Dam Quadrangle, South Dakota: Part II — Precambrian."

**Dr. Patricia Mahon**, vice president, student affairs, and dean of students, received \$142,000 from the United States Department of Education for the project, "Campuses Community Prevention Coalition." **Dr. Mahon** also received \$75,000 from the United States Department of Health and Human Services for the project, "School of Mines Campus Suicide Prevention Project."

**Dr. James Martin**, professor emeritus, Department in Geology and Geological Engineering, received \$5,500 from the United States Department of Interior — Bureau of Land Management for the project, "Preparation of Plesiosaur Fossil and 2 Casts." **Dr. Martin** also received \$2,500 from the Bureau of Land Management (Prime: United States Department of Interior) for the project, "Fossil Lake Field School Cooperative Project."

**Dr. Todd Menkhaus**, assistant professor, Department of Chemistry, received \$25,000 from the South Dakota Board of Regents for the project, "EPSCoR Matching for Faculty Start-Up Packages & NSF PFI STEP Program."

**Ms. Deborah Mitchell**, director, Apex Gallery, and associate professor, Department of Humanities, received \$1,000 from the South Dakota Humanities Council for the project, "Letter Press Training."

**Dr. Anil Patnaik**, assistant professor, and **Dr. Venekataswamy Ramakrishnan**, distinguished professor emeritus, Department of Civil and Environmental Engineering, received \$70,000 from the South Dakota Department of Transportation (Prime: United States Department of Transportation — Federal Highway Administration) for the project, "Evaluation of Crack-Free Bridge Decks."

**Dr. Gautam Pillay**, vice president for Research, received \$18,000 from the South Dakota Board of Regents for the project, "EPSCoR Matching for Faculty Start-Up Packages & NSF PFI STEP Program."

**Dr. Jan Puszynski**, professor, Department of



Chemical and Biological Engineering, **Dr. Jacek Swiatkiewicz**, instructor and research scientist, Department of Chemistry and Chemical Engineering, and **Dr. Vladimir Sobolev**, associate professor, Department of Physics, received \$455,126 from the United States Department of Defense — Army Research Office (EPSCOR) for the project, "Thermal, Impact, and Electrostatic Sensitivities of Energetic Nanocomposites." **Drs. Puszynski** and **Swiatkiewicz** also received \$110,000 in additional funding from the National Science Foundation for the project, "Combustion Synthesis of Nanocomposite Materials." In addition, **Dr. Puszynski** received \$24,980 from Navsea Indian Head (Prime: United States Department of Defense) for the project, "Development of Iron Oxide, Aluminum, and Silicon Ignition Delay Mixture," \$30,000 for the project, "Determination of Ignition Temperatures and Densification of Reactive Powdered Mixtures," and \$88,749 in additional funding from the University of Minnesota for the project, "Processing Behavior of Nanoenergetic Materials."

**Dr. William Roggenthen**, professor, Department of Geology and Geological Engineering, received \$22,429 in additional funding from Black Hills State University (Prime: National Science Foundation) for the project, "A Black Hills Science Teaching Project to Prepare K-8 Teachers for the New Millennium."

**Dr. James Sears**, research scientist IV, Additive Manufacturing Laboratory, received \$160,000 in additional funding from Carpenter Powder Products for the project, "Development of Functionally Graded Materials for Manufacturing Tools and Dies and Industrial Processing Equipment."

**Dr. Dale Skillman**, assistant professor, Department of Mechanical Engineering, received \$36,310 from the South Dakota Department of Tourism and State Development (Subaward from Dakota State University) for the project, "West River SBIR Coordinator — FY06."

**Dr. Paul Smith**, professor emeritus, Institute of Atmospheric Sciences, received \$33,601 in additional funding from the National Science Foundation for the project, "Armored T-28 Aircraft Facility for Research Requiring Storm Penetrations."

**Ms. Julie Smoragiewicz**, vice president, Office of University and Public Relations, received \$149,980 from the Institute of Museum and Library Services for the project, "Hands-On Partnership for Science, Literature, and Art in South Dakota."

**Dr. James Stone**, assistant professor, Department of Civil and Environmental Engineering, received \$21,242 from the South

## Research Notes *continued*

Dakota Board of Regents for the project, "Governor's 2010 Individual Research Seed Grant Award."

**Dr. Pallaoor Sundareshwar**, assistant professor, Department of Atmospheric Sciences and Institute of Atmospheric Sciences, **Dr. Patrick Zimmerman**, director, Institute of Atmospheric Sciences, **Dr. James Stone**, assistant professor, department of Civil and Environmental Engineering, and **Dr. Scott Kenner**, chair and associate professor, Department of Civil and Environmental Engineering, received \$269,857 from the National Science Foundation for the project, "Acquisition of Equipment Cluster to Strengthen a Multi-Disciplinary Regional Biogeochemistry Core Facility for Research and Training."

**Dr. Keith Whites**, professor/Steven P. Miller chair, Department Electrical and Computer Engineering, received \$5,000 from the Air Force Institute of Technology for the project, "Enhancing Electro-Magnetic Waveguide Probes for Non-Destructive Evaluation."

**Dr. Karen Whitehead**, provost and vice president for Academic Affairs, received \$20,000 from the Great Plains Education Foundation for the project, "Support for an Academic Summer Bridge Program." **Dr. Whitehead** also received \$12,340 in additional funding from South Dakota Board of Regents (Prime: United States Department of Education) for the project, "South Dakota Teacher Quality Enhancement Grant — STEP — Alignment Tool," and \$50,000 from the South Dakota Department of Education for the project, "Professional Development in Mathematics for High School Teachers."

**Dr. Robb Winter**, professor and chair, Department of Chemical and Biological Engineering, received \$440,523 from the National Science Foundation for the project, "SDSM&T RET Site: Inspiring Educators in Rural America through Research." **Dr. Winter** also received \$29,660 from the University of South Dakota (Prime: National Science Foundation) for the project, "South Dakota Science/Technology Entrepreneurship Program," and \$115,692 in additional funding from the National Science Foundation for the project, "SDSM&T-MUS&T REU Site Collaboration," and \$25,000 from the South Dakota Board of Regents for the project, "EPSCoR Matching for Faculty Start-Up Packages & NSF PFI STEP Program."

**Dr. Nian Zhang**, assistant professor, Department of Electrical and Computer Engineering, received \$22,259 from the South Dakota Board of Regents for the project, "Governor's 2010 Individual Research Seed Grant Award."

**Dr. Patrick Zimmerman**, director, Institute of Atmospheric Sciences, received \$10,000 in additional funding from Montana State University (Prime: U.S. Department of Energy) for the project, "The Northern Rockies and Great Plains Regional Carbon Sequestration Partnership."



# Personnel Changes

## Welcome:

- **Patricia L. Casey**, temporary CSA, Program Assistant I, University and Public Relations (10/11/05)
- **Kelly L. Clever**, temporary CSA, Secretary, Museum of Geology (10/11/05)
- **Jamie L. Lembke**, Exempt, Admission Counselor, Admissions (10/3/05)
- **Paula M. DeMars**, CSA, Secretary, Chemistry (9/15/05)
- **Karel A. Bielstein**, Faculty, Instructor, Geology and Geological Engineering (9/14/05)
- **Miaken L. Zeigler**, Exempt, Admission Counselor, Admissions (9/14/05)
- **Cheryl M. Arguello**, CSA, Secretary, Multicultural Affairs (9/1/05)
- **Jacob M. Colvin**, temporary Exempt, Research Scientist II, Additive Manufacturing Laboratory (9/1/05)
- **David L. Janovy**, Faculty, Instructor, Electrical and Computer Engineering (8/29/05)
- **Dr. Kyeongsik Woo**, temporary Exempt, Research Scientist II (Postdoctoral Fellow), Mechanical Engineering (8/28/05)
- **Curtis W. Cook**, Exempt, Director, Women in Science and Engineering (WISE) Program (8/22/05)
- **Maria F. Cadwallader**, Exempt, Assistant Women's Basketball Coach (8/16/05)
- **Cheryl L. Dillon**, CSA, Secretary, Ivanhoe International Center/Information Technology Services/Surbeck Center (8/16/05)
- **Dr. James D. Castleberry**, temporary Faculty, Associate Professor, Social Sciences (8/15/05)
- **David R. Coleman IV**, Faculty, Instructor, Chemistry (8/15/05)
- **Mary Jo Farrington**, Exempt, Campuses Community Prevention Coalition (CCPC) Project Coordinator (8/15/05)
- **Dr. Glen A. Hansen**, Faculty, Assistant Professor, Mathematics and Computer Science (8/15/05)
- **Constance E. Hubbard**, temporary Faculty, Instructor, Humanities (8/15/05)
- **Dr. Dean H. Jensen**, Faculty, Assistant Professor, Industrial Engineering (8/15/05)
- **Kristopher R. Jensen**, Faculty, Instructor, Electrical and Computer Engineering (8/15/05)
- **James A. Nelson**, temporary Faculty, Instructor, Mathematics and Computer Science (8/15/05)
- **Dr. Steve J. Smith**, Faculty, Associate Professor, Nanoscience and Nanoengineering (8/15/05)
- **R. Scott Wiley**, temporary Exempt, Counselor, Student Affairs (8/15/05)
- **Dr. Myung-Keun Yoon**, Faculty, Assistant Professor, Mechanical Engineering (8/15/05)
- **Dr. Todd J. Menkhaus**, Faculty, Assistant Professor, Chemical and Biological Engineering (8/8/05)
- **Patrick W. Baker**, Exempt, Coordinator of Multicultural Activities/Assistant Football Coach, Multicultural Affairs/Intercollegiate Athletics (8/1/05)
- **Joshua A. Boyer**, Exempt, Assistant Football Coach/Assistant Intramural Director/Wellness Center Supervisor, Intercollegiate Athletics (8/1/05)
- **Bruce L. Carter**, Exempt, Director, Multicultural Affairs (8/1/05)
- **Jon Travis Everhart**, Exempt, Assistant Football Coach/Strength and Conditioning Coach, Intercollegiate Athletics (8/1/05)
- **Eric M. Glenn**, Exempt, Assistant Men's Basketball Coach/Head Men's and Women's Golf Coach, Intercollegiate Athletics (8/1/05)



## Personnel Changes *continued*

- **Shawn R. Moulton**, Exempt, Hall Director, Residence Life (8/1/05)
- **Kristiaan A. Rawlings**, Exempt, Hall Director, Residence Life; Leadership/Program Coordinator, Student Activities and Leadership Center (8/1/05);
- **Dr. Dana J. Medlin**, Faculty, Associate Professor, Materials and Metallurgical Engineering (7/5/05)
- **Leah M. Novicki**, Assistant Volleyball and Track Coach, Intercollegiate Athletics (7/5/05)
- **Dr. Yi Liu**, Exempt, Research Scientist I, Chemistry and Chemical Engineering (6/1/05)
- **Randall F. Warren**, Faculty, Instructor, Chemistry and Chemical Engineering (6/1/05)
- **Bonny L. Baker-Cain**, CSA, Secretary, Higher Education Center West River (4/20/05)

### Farewell:

- **Leslie T. Kelley**, CSA, University and Public Relations (9/28/05)
- **Michelle M. Gilbert**, CSA, Admissions (9/16/05)
- **Derek D. Andrews**, Exempt, Admissions (9/6/05)
- **Jason M. Tschetter**, Exempt, Admissions (9/6/05)
- **Marvin W. Lorenz**, Exempt, Information Technology Services (9/2/05)
- **Joan C. Lindstrom**, Exempt, Counseling and Student ADA Services (9/1/05)
- **Adrian E. Verwolf**, temporary, Exempt, Research Scientist I, Institute of Atmospheric Sciences (8/31/05)
- **Stephen Buchholz**, Exempt, University and Public Relations (8/12/05)
- **Dr. Jacquelyn Bolman**, Exempt, Office of Research Affairs (7/31/05)
- **Dr. Chris Jenkins**, Faculty, Mechanical Engineering (7/31/05)
- **Wesley Roth**, Exempt, Residence Life (7/31/05)
- **Dr. James M. Munro**, Faculty, Chemistry and Chemical Engineering (6/30/05)
- **William W. Jones**, Exempt, Academic and Enrollment Services (6/30/05)
- **Steven C. LaMarine**, Exempt, University and Public Relations (6/30/05)
- **Dr. Xianzhi (Amanda) Song**, Exempt, Chemistry and Chemical Engineering (6/30/05)
- **Richard D. Sweeney**, Exempt, Athletics (6/30/05)
- **Dr. Qianlai Zhuang**, Faculty, Institute of Atmospheric Sciences (6/30/05)
- **Matthew C. Stevens**, CSA, Title III (6/17/05)
- **Dr. Artem Masunov**, Faculty, Chemistry (6/15/05)
- **Naomi Fossen**, Exempt, Hall Director, Residence Life (5/15/05)
- **Katherine (Katie) Pavel**, Exempt, Admissions Counselor, Academic and Enrollment Services (5/26/05)
- **Katherine (Kata) McCarville**, Exempt, Research Scientist I/Associate Director, Institute of Atmospheric Sciences (5/31/05)
- **Michael S. Larsen**, Exempt, Assistant Volleyball and Track Coach, Intercollegiate Athletics (5/15/05)
- **Karen E. Powell**, Exempt, Asst Women's Basketball Coach, Intercollegiate Athletics (5/15/05)
- **Amy L. Bauer**, Faculty, Instructor, Humanities (5/19/05)
- **Dr. Kyle Felling**, Faculty, Assistant Professor, Chemistry and Chemical Engineering (5/19/05)
- **Dr. Cynthia Holte**, Faculty, Instructor, Chemistry and Chemical Engineering (5/19/05)
- **Dr. Larry G. Meiners**, Faculty, Professor, Electrical and Computer Engineering (5/19/05)

- Engineering (5/19/05)
- **Emily M. Price**, CSA, Secretary, Graduate Education and Office of Research Affairs (5/19/05)
- **Dr. Guangyu Fan**, Exempt, Research Scientist I, Chemistry and Chemical Engineering (4/30/05)
- **Jack A. Rice**, Exempt, Golf Coach, Intercollegiate Athletics (4/30/05)
- **Ruth M. Blesh**, CSA, Secretary, Museum of Geology (4/29/05)
- **Darren M. Soucy**, Faculty, Assistant Professor, Physical Education (4/5/05)

### Changes:

- **Breanna V. Bishop**, from CSA, Information Specialist, Educational Programs and Professional Conferences, University and Public Relations to Exempt, Public Information Coordinator, University and Public Relations (10/17/05)
- **Ellen I. Haffner**, CSA, from Accounting Assistant, Graduate Education and Sponsored Programs to Secretary, Admissions (10/12/05)
- **Sharon F. Dominick**, CSA, from Senior Secretary, Institute of Multiscale Materials (IMM) to Senior Secretary, University and Public Relations (10/10/05)
- **Jason R. Erickson**, Exempt, from Communication Network Analyst, Information Technology Services to Associate Director of Technology Services, Information Technology Services (10/6/05)
- **Dr. James Martin**, from Faculty, Professor, Geology and Geological Engineering; Curator of Vertebrate Paleontology, Museum of Geology retired (7/31/05) to Professor Emeritus, Geology and Geological Engineering (9/1/05)
- **Judith M. Chilstrom**, CSA, from Secretary, Mathematics and Computer Science to Secretary, Academic Affairs (8/26/05)
- **Dr. Glen A. Stone**, from Faculty, Professor, Materials and Metallurgical Engineering retired (5/19/05) to temporary Faculty, Professor Emeritus, Materials and Metallurgical Engineering (8/15/05)
- **Barbara Hansen**, Exempt, from Recruitment Counselor, Mining Engineering and Management to Admission Counselor, Admissions (8/1/05)
- **D. Hugh Welsh**, from Faculty, Professor, Physical Education; Athletic Director and Men's Head Basketball Coach, Intercollegiate Athletics retired (6/30/05) to Faculty, Athletic Director, Intercollegiate Athletics (8/1/05)

## Memorials

### Dr. John T. Vucurevich

Dr. John T. Vucurevich, 92, died July 16, 2005, in Rapid City.



Dr. Vucurevich grew up in Lead before joining the United States Army, serving during World War II. He served in the South Dakota State Legislature in the late 40s and early 50s. He was an active member of the community and served Rapid City and the Black Hills Area through his establishment of the John T. Vucurevich Foundation.

South Dakota School of Mines and Technology was one of the many benefactors of Dr. Vucurevich's philanthropic generosity with the establishment of the John T. Vucurevich Scholarship Fund. This fund was established in 1997. Since then, 227 students have received more than \$235,000 in scholarships from this fund.

Dr. Vucurevich received an honorary doctorate from the School of Mines in 1992.

# Calendar of Events

Visit the on line calendar for details:  
[www.hpcnet.org/sdsmtcalendar](http://www.hpcnet.org/sdsmtcalendar)  
 For details about K-12 events:  
[www.hpcnet.org/SDTechK-12](http://www.hpcnet.org/SDTechK-12)  
 For details about athletic events:  
[www.sdsmt.edu/athletics](http://www.sdsmt.edu/athletics)

## February is Black History Month

### February 4

Legislative Crackerbarrel Meeting - Classroom  
 Building 204 - 9:00 AM

### February 9

Spring Career Fair - Surbeck Center Ballroom  
 - 9 - 12 and 1 - 4 PM

### February 11

Legislative Crackerbarrel Meeting - Classroom  
 Building 204 - 9:00 AM

### February 11-12

Math Modeling Competition - McLaury Building

### February 14

Valentine's Day

### February 16

Matters of the Heart: Health and Wellness Expo -  
 10 AM - 3 PM - Surbeck Center Ballroom

### February 18-25

National Engineers Week

### February 20

Presidents' Day - No Classes

### February 23

Order of the Engineer and Outstanding Recent Grad  
 Luncheon - Surbeck Center Ballroom - 11:00 AM

## March is Womens History Month and

## National Nutrition Month

### March 3-12

Spring Break - No Classes

### March 31-April 1

Cultural Expo

### March 17

St. Patrick's Day

### March 19-25

Greek Week

### March 21-23

CAAP Exams

### March 24

High Plains Regional Science and Engineering Fair  
 - Surbeck Center Ballroom

### March 31

Camp Unveiling

Cultural Expo

State Geography Bee - King Center - 12:00 PM

### April 1

Cultural Expo

### April 3-25

Early Registration Weeks (Tentative)

### April 4

Honors Convocation - Surbeck Center Ballroom  
 - 11:00 AM

### April 7

Last day to drop classes

### April 11

Engineering Girls (Girls Into Real Learning Succeed)  
 8:30 AM - 2:00 P.M.

### April 14-17

Easter Holiday - No Classes

### April 16

Easter Sunday

### April 29

Junior Preview Day - Surbeck Center Ballroom  
 - 8:30 AM - 1:30 PM

### May 1

Safe Senior Week

### May 5

Cinco de Mayo

### May 8-12

Final Exams

### May 13

Spring Graduation

### May 15

West River Math Contest

### May 29

Memorial Day

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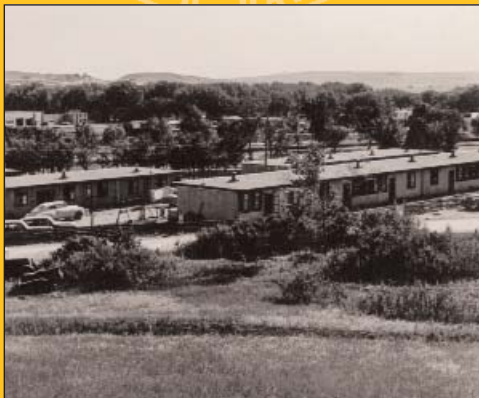
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# Tech Trivia

*Did you know that...*

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



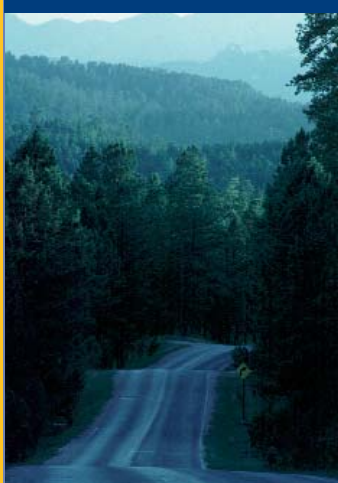
- That the American Society of Civil Engineers student chapter won the 1995 concrete canoe national championship? The canoe, Predator, weighed 90 pounds.



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



7:40 a.m. Rush Hour



in the Black Hills of  
South Dakota

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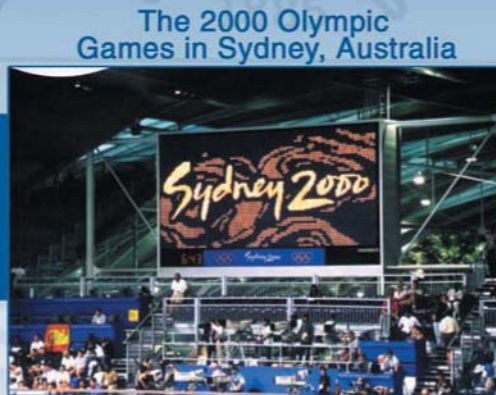
**John Mette**  
1989 graduate of SDSM&T



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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