

# QUARTERLY

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY

FALL 2000



**Tech**  
**Paleontologists**  
**Dig Down Under -**

*Story page 10*

A PUBLICATION OF SDSM&T





Dear Friends,

We live in a time of exciting advances in information and communication technologies. These advances in technology provide important new ways to enhance the learning of students in our classrooms and laboratories. The investments made throughout the university in the newest developments in computing and networks give us the capability to prepare our graduates for the dynamic environment of today's industries.

Leaders of industry urge that we expand the preparation of science and engineering graduates so that they may integrate the technological opportunities of many disciplines to create the products needed to compete in today's global marketplace. We are pleased that the bold commitment made by our faculty six years ago to form four multidisciplinary colleges has placed the university in an ideal position to respond to the needs of industry. The three-year old Center of Excellence for Advanced Manufacturing and Production has created important new programs to prepare our graduates to lead multidisciplinary design and development teams.

The receipt of the nation's award for the most innovative engineering education program recognizes the success of our faculty, students, and staff in creating a multidisciplinary technology development environment. Engineers of Boeing Aircraft, acting on behalf of the industries employing engineering graduates, found that our Center for Advanced Manufacturing and Production provided the most innovative approach to providing the multidisciplinary team experiences urgently needed to prepare graduates for leadership positions in industry.

Congratulations to the many members of the faculty who have collaborated with our industrial advisory groups and our students to create the award winning multidisciplinary environment that prepares graduates to lead their chosen professions in science and engineering.

Sincerely,

Richard J. Gowen, President

## SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY QUARTERLY FALL 2000

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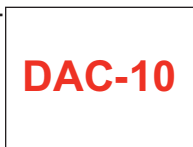
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## CAMPUS

## Profile

The South Dakota School of Mines and Technology, founded in 1885, has been a national leader in preparing world-class engineers and scientists. Our graduates design, construct, and operate modern technology to meet complex challenges such as global warming, health care delivery, energy resource development, mineral extraction and processing, environment 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.

Tech has diversified to meet the needs of engineering and science throughout the world. South Dakota Tech's intellectual environment was shaped a century ago by the ingenuity and rugged individualism of pioneers in science and technology. Tech's present day pioneers provide inspiration and remain on the cutting edge in the fields of engineering and the sciences.

**ACADEMIC PROGRAM:** SDSM&T is a state-assisted university providing graduate and undergraduate degrees in science, engineering, and interdisciplinary studies.

### BACHELOR OF SCIENCE DEGREES

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

### MASTER OF SCIENCE DEGREES

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

### Engineering

### DOCTORATE OF PHILOSOPHY DEGREES

Atmospheric, Environmental, and Water Resources  
Geology and Geological Engineering  
Materials Engineering and Science

**ENROLLMENT:** The University has a diverse enrollment of approximately 2,275 students from 39 states and 27 countries. Our 13 departments offer 29 degree programs in engineering and science disciplines at the baccalaureate, masters, and doctoral levels. Students enter the university with the highest ACT composite in the state and more than half graduating within the top 25% of their high school.

**COSTS AND FEES:** Annual undergraduate costs for tuition, fees, room, and board total less than \$8,200 per year for South Dakota residents and less than \$10,900 for residents of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Iowa, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming. Annual total costs for all other undergraduates is less than \$12,400 per year.

**RESEARCH:** High quality research is conducted in departments and in our research institutes.

**FACULTY:** There are approximately 125 faculty with degrees from more than 150 institutions, eighty five percent of which have earned doctoral degrees.

# Satellite Technologies Aid Te

## Surveying of Remote Area

**D**r. Colin Paterson, Professor, Department of Geology & Geological Engineering, and Dr. Ed Duke, Professor, Department of Geology and Geological Engineering, traveled to Namibia, Africa, in August to begin field data collection on a project that will concentrate on mapping and resource evaluation in Namibia, Africa. The project is entitled "Potential of Hyperspectral Remote Sensing for Geological Mapping and Resource Evaluation in Arid Regions, using the Damaran Terrane of Namibia". The two were awarded a \$42,000 National Science Foundation (NSF) grant for support of the project. The purpose of the three-year program is to test state-of-the-art field-based and remote-sensing measurements and to introduce these modern technological methods to geological researchers in Namibia.

Remote sensing is the science of measuring the composition of materials on the Earth's surface from aircraft or satellite. Agricultural crops are monitored to assist predication of global food supplies. Major disasters such as fires and floods may be recorded to plan for remediation.

Remote sensing includes aerial photography, but more commonly involves use of spectrometers to measure the energy that is reflected off earth materials as a result of impact of the sun's rays. This reflected energy includes not only the visible light spectrum but also invisible energy of longer wavelengths, such as infrared.

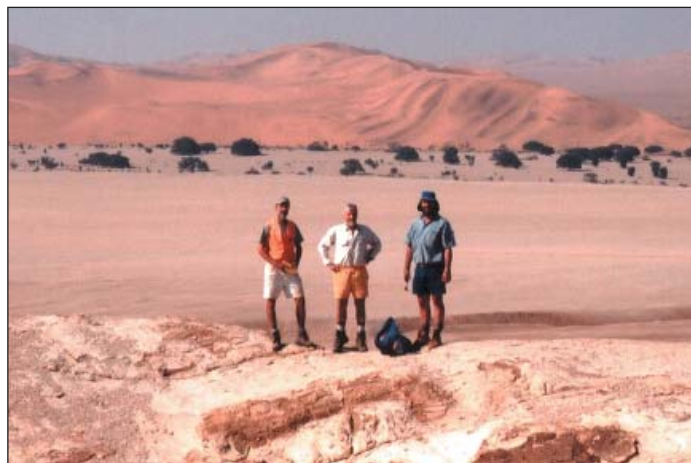
The launch of the first Landsat satellite in 1972 ushered in a new era in geological mapping and resource evaluation. Landsat and other "multispectral" systems measure the spectrum of reflected sunlight in a small number of broad bands or channels. In the past ten years new technological breakthroughs have resulted in the development of airborne spectrometers with hundreds of spectral bands. These "hyperspectral" systems provide sufficiently detailed data so that it is possible, not merely to see differences in the physical characteristics of rock formations, but to identify individual species of minerals, to estimate dimensions of species, and in some cases to determine the chemical composition of minerals. Along with the development of these spectrometers has come a variety of portable field spectrometers designed for calibration and ground-truthing the remotely-sensed data. Field spectrometers are also revolutionizing methods for identification of minerals in the field by providing a method that is quick, inexpensive, requires no sample preparation, and is effective on materials that are too fine grained for other methods.

National Science Foundation funding over the past two years has enabled SDSM&T to develop field-based and remotely-sensed spectroscopic methods for mapping variations in the distribution and compositions of metamorphic minerals in metamorphic rocks. These results have improved the ability to map past thermal and compositional gradients in the Earth's crust and the locations of focused fluid. Although the field-based methods used in the current project can be applied in all geological environments, the

remote sensing methods are suitable only in areas free of continuous vegetative cover. In addition to parts of the southwestern U.S., this includes vast zones of Africa, Asia, and Australia. This project represents the first step in attempting to evaluate the potential of these new research methods in areas outside the U.S., particularly in regions where research infrastructure may be limited and therefore remote sensing methods most beneficial.

Several new hyperspectral satellite systems will be launched during the three-year period of the project. These will provide global coverage, with excellent spectral detail, and measure areas on the ground as small as eight meters across. Additionally, the Terra satellite, the flagship of NASA's Earth Observing System, entered orbit in 1999 and will be providing multispectral global coverage in the visible and near infrared wavelenths and—for the first time—multispectral thermal infrared imagery from the ASTER instrument onboard. ASTER—the Advanced Spaceborne Thermal Emission Radiometer—is a joint U.S.-Japanese instrument and the data will be distributed through the EROS Data Center in Sioux Falls. The availability of such imagery will create unparalleled opportunities for geological research in areas of the globe, which previously have been difficult to study because of poor access or limited research possibilities. By adopting the technology to process and manage these hyperspectral data, developing nations will gain powerful capabilities for evaluating and monitoring natural resources and natural hazards, and for designing engineering solutions to meet demands of population growth, economic development, and climate change.

Studies incorporating applications of remote sensing require areas that have an arid climate, are sparsely vegetated, and have extensive rock exposures. North central Namibia, flanked by the Namib and Kalahari Deserts, is extremely suitable with arid climate and sparse vegetation. The major geological province in this area



*Dr. Ed Duke, Dr. Colin Paterson, and Volker Petzel (Deputy Director, Geological Survey of Namibia), on outcrop with Kweseb River and sand dunes of the Namib Desert in the background.*



# Each Geologists in as of Africa

is known as the Damaran terrane—an area in which sedimentary rocks were deposited, folded, and heated between 1.0 billion and 0.6 billion years ago. Rocks of the Damaran terrane are well exposed, and include a variety of lithologies over a wide range of metamorphic grade as well as many different metal-bearing ore deposits. Such continuity across an orogen is quite remarkable in contrast to the southwest U.S. where terranes are extremely disjointed because of subsequent tectonic events.

In Namibia, the project benefits from a high level of local collaboration, under the auspices of the Geological Survey of Namibia. The principal collaborators in Namibia, Volker Petzel and Herbert Roesener, are intimately familiar with the regional geology and have access to the most current information on the descriptive aspects and genetic models for Namibian mineral deposits. Petzel and Roesener will be involved in orientation of the U.S. visitors to the Namibian project locations, as well in discussions related to direction of the research program.

One of the emphases of the Namibian Geological Survey is mapping of Damaran stratigraphy and dating of geological events. In light of the heavy workload of regulatory activities and small manpower devoted to mapping, this collaboration will complement current activities by developing a procedure for rapid mapping by remote sensing. Another focus is development of a database for mineral occurrences in Namibia (NAMDAT); this study will provide information that will assist this process by identifying geological environments in which new mineral resources may be identified.

While employed as a faculty member at the University of Cape Town, South Africa, Dr. Paterson directed a thesis on the Berg Aukas deposit in Namibia's Otavi Mountainland, and was department examiner of two theses on the Damaran terrane of Namibia. He has conducted research on ore deposits and

exploration in southern Africa and elsewhere. His research emphasis has been on hydrothermal metallic deposits, with additional experience in the application of Geographic Information Systems to mineral exploration through a NASA Space Grant Fellowship at the U.S. Geological Survey's EROS Data Center in 1993.

Dr. Duke has been conducting research on geological remote sensing since 1991 when he was a visiting scientist at the EROS Data Center, focusing on integration of remotely-sensed data and GIS for mineral exploration and mineral deposit modeling, applications of hyperspectral remote sensing, and field and laboratory spectrometry. Since 1997, his emphasis has been on spectroscopic methods for mapping metamorphic rocks and deriving quantitative parameters related to metamorphic reactions and metamorphic pressure and temperature conditions. The principal research instrument for this work is a field-portable visible and near infrared spectrometer that was purchased with NSF funding in 1997. The instrument was upgraded in March 2000 for state-of-the-art performance and ease of use in the field, using supplemental funds provided by NSF. The portable spectrometer will be used extensively to collect spectra in the project areas, namely Otavi Mountainland, Navachab, and in a transect through the range of metamorphic grade in the Damaran terrane between Tsumeb and Windhoek.

During the project, Paterson and Duke will continue their close collaboration with the EROS Data Center, which will provide current satellite imagery from Landsat 7 and facilitate acquisition of new ASTER data when that becomes available to the research community at large later in 2000. EROS will also host a one-week workshop on remote sensing data and analysis methods for two Namibian geologists and a graduate student in 2001.

The SDSM&T graduate student working on this project is Belal Hansrod, a citizen of Mauritius. Mr. Hansrod has a long-standing interest in mineral resources of Subsaharan Africa, and intends to focus his M.S. thesis research on applications of remote sensing in that region.



Photos courtesy of Dr. Colin Paterson



*Dr. Ed Duke measuring spectra of rocks at the Khuseb Springs mine, Otavi Mountainland in northern Namibia. Belal Hansrod and Dr. Colin Paterson are discussing the next site for data collection.*

# 2000 Return for



Dr. Gowen participating in the tunnel activities.

Reunion 2000 was a success with more than 2,000 people attending the events. The reunion that was held at SDSM&T on July 6, 7, and 8 was largely a success due to the efforts of hundreds of people, according to Tim Vottero, Director of the Alumni Association at Tech. "There was a lot of participation from family, friends, staff, and alumni volunteers," Vottero said. "Several people commented that this was the most family-friendly reunion they had attended, and that they really appreciated the effort put into making this event fun for all involved." Friends were reunited with friends, alumni were reunited with their alma mater.

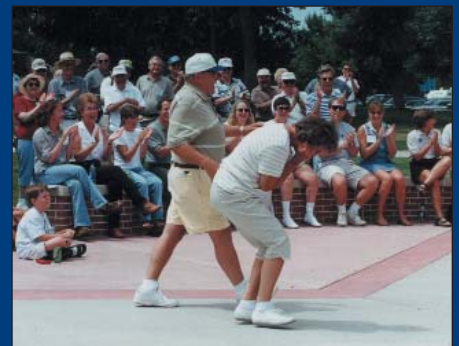


Earl Schwarzenbach (EE '29) and Bob Oliver (TM, Rapid City) following Earl's first Harley ride with Bob.



The campus Quad was filled with spectators as they watched the Corvette raffle.

Reuben (EE '58) and Marilyn Rieger were the lucky winners of a restored 1963 Corvette raffled by the SDSM&T Foundation during the Reunion 2000 Picnic on July 7, 2000.





# r Reunion 2000



Dr. Gowen, assisted by Paul Gnirk (MinE '59) and Dr. Howard Peterson (GeolE '50), cuts the ribbon at the Arch dedication.



Alumni making the trek up M-Hill.



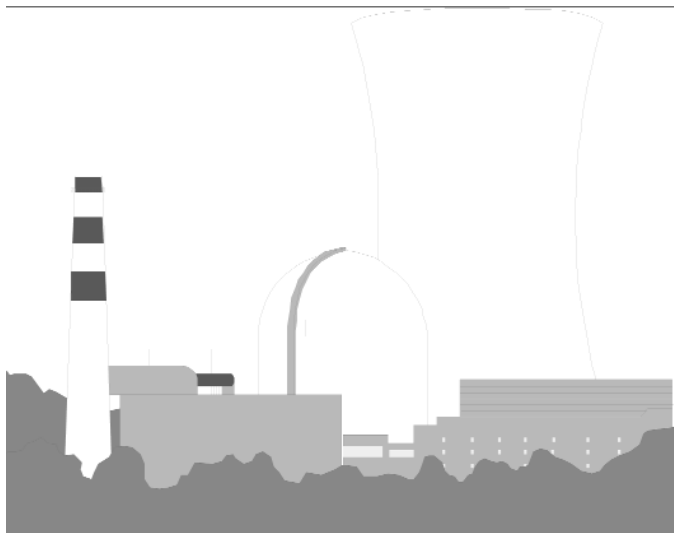
Bill Benda (EE '57) and Jim Hayes (GenE '59) teamed up for the Dud King Golf Classic at the Elks Golf Course on July 7th.



Future SDSM&T student checks out campus facilities at the reunion picnic.



# TECH ALUM FUSE AND BALLROOM



While nuclear energy and ballroom dancing may seem like an odd combination, coming from the mouth of SDSM&T alumni Lowell Jobe (ChemE '38) they seem like perfect companions. Perhaps because Jobe shows equal passion and enthusiasm for both. His enthusiasm is also apparent when discussing the Scientific Knowledge for Indian Learning and Leadership (SKILL) endowment that he granted to SDSM&T after the sale of his first home in Idaho Falls, Idaho. "My endowment to SDSM&T was based upon my recognition of the raw deal the Native Americans have received at the hands of our federal government, particularly in the 19th and early 20th centuries. When one considers what the western culture has done to the environment in the total picture, including former native populations, it is up to today's developed people to make some corrections." Jobe continued, "I consider the South Dakota Native Americans to be given the bottom of the dregs of land and resources that any Native Americans have received. My endowment was created to help educate the younger generation so they can fulfill their role to hopefully benefit their people or at least themselves. That is why the SKILL program has the primary benefit, with scholarship money being available for those who eventually make the grade as SDSM&T students."

Born on August 28, 1914, in Lead, South Dakota, Jobe graduated from Lead High School in 1932. He then spent two years working for the Homestake Mining Company to earn money for School of Mines tuition. In 1934 he enrolled at SDSM&T, graduating in 1938 with a Bachelor of Science in Chemical Engineering. "One of the most important

values I received at the School of Mines was in the Pro-Seminar class where we were

indoctrinated with the 'second mile' concept as applied to professional behavior. I have carried that through my professional life and made it an important concept for my students in both teaching positions I had," Jobe said. "Of course, you have to also include proficiency requirement to do your job correctly. Unfortunately, I am afraid that much of the business world has lost sight of some of the concepts of our generation, although many persons now do dedicate their efforts and resources for the betterment of mankind."

Jobe earned his Master of Science in Chemical Engineering at the University of Iowa in 1939. He then began his professional career at the Water Treatment Department of Graver Tank and Manufacturing Company of East Chicago, Indiana, where he was in charge of the laboratory, process design, specifications, and startup of all complexion exchange plants.

In 1947, he became Assistant Professor of Chemical Engineering at the University of Idaho, where he introduced courses in water and waste treatment, automatic process control, and the first graduate course in Nuclear Chemical Engineering taught at University of Idaho. He was also responsible for directing research on rare earth separations from Idaho monazite, and spent two summers each at the Oak Ridge National Laboratory (ORNL) and Hanford nuclear plants. In 1960 he was employed as Senior Process Control Engineer at the Idaho Chemical Processing Plant (ICPP) located at the National Reactor Testing Station (now known as the Idaho National Engineering and Environmental Laboratory or

INEEL). He holds two patents from his work there.

Retiring from INEEL in 1980, he taught at Eastern Idaho Vocational Technical School, where he developed the only known one-year Process Technology curriculum to train technicians particularly to work at INEEL. "One concept that I developed in my work and teaching was the realization that the maximization of job or living values requires total system thinking, which goes beyond any one branch of science, engineering, or any other field and extends to total global thinking. One of the most important values of systems thinking is to be able to use scientific principles in predicting effect of variables in designing operating systems to eliminate or reduce upsets," said Jobe.

He retired for a second time in 1985, but is active in volunteer work, including Coalition 21, which is dedicated to supporting tomorrow's technologies. "People ask, what's the 21?" said Jobe. "Well it's the 21st century. The purpose of the coalition is to put out facts; facts to overcome fears." The coalition's efforts are heavily involved with nuclear issues for the 21st century. Jobe feels that both the public and the politicians need to be educated on the value of nuclear energy. "It is important to turn the whole nuclear business around to a positive approach because we're going to need it in the coming millennium in order to supply the extra energy that's going to be



*Lowell Jobe smiles for a picture Reunion 2000.*



# ES NUCLEAR POWER DOM DANCING

needed by growth, and to also reduce the amount of pollution that comes from the carbon-bearing fossil fuels.” Jobe commented, “If you don’t do that, then the carbon in the atmosphere is going to increase - while nuclear energy will not add carbon to the atmosphere.”

His contributions to the coalition include a paper presented at the Idaho Academy of Science in 1997 entitled “The Integral Fast Reactor: A Political Assassination.” He also authored Coalition 21’s commentaries to the Department of Energy (DOE) entitled “Surplus Weapons Plutonium Disposition DEIS (Draft Environmental Impact Statement)” September, 1998, “DEIS for Sodium-Bonded Spent Nuclear Fuel” September, 1999, and “EIS-0287D on Idaho High Level Waste” March, 2000. Recently a Guest Commentary titled “Nuclear Option Serves Economy and Environment,” that Jobe authored, was published in the Idaho Falls Post Register.

Jobe is quick to point out the benefits of nuclear energy. “Nuclear energy is an inexpensive, safe, and clean way to produce electricity. Most of the world’s electricity produced today comes from nuclear and coal-burning power plants. Nuclear energy from #1 of uranium is three million times that produced by #1 of coal. On the environmental side, however, the generation of 1000 Megawatts of electricity by a coal-burning power plant produces seven million tons of carbon dioxide greenhouse gas,

1000 tons of sulfur dioxide and nitrogen oxide acid rain gases, 1400 tons of particulates, and up to one million tons of ash.” Jobe stated, “Compare this to 38 tons of (so-called) spent fuel from a nuclear reactor, which it is proposed to be buried. If one could remove the political costs from the true engineering economic costs and contractual spent fuel costs, the public might favor nuclear power even more than now.”

The safety of nuclear energy is another factor that the public misunderstands according to Jobe. “Engineers react to problems that occur in their fields, determine the facts behind the problems, and then decide what needs to be done to solve the existing problem and prevent it from occurring again. Therefore, the public needs to recognize the fact that the future is safer than the past.” Jobe remarked, “TMI (Three-Mile Island) resulted in immediate action to improve nuclear regulations and safety designs; there has never been a repeat of the errors that caused the TMI incident. Multiple back-up systems were adopted. The fact that no member of the public has ever been killed from the operation of American-type nuclear plants should answer safety questions. There is no alternate electrical source that can make this claim.”

Jobe lists some of the characteristics that he feels are needed in the next generation of nuclear power to make the use of nuclear energy feasible. “It has to be affordable relative to the alternatives that we have now for power. It has to be safe even when massively employed, and it has to be ecologically responsible in terms of everything from mining, shipping, and waste handling.” Jobe said, “Cost is an important consideration, and this is applicable to developed and developing



economies alike. In other words, the major future expansions in energy requirements are going to come to the developing countries. And then it has to be sustainable and resistant to misuse for military or terrorist purposes.”

Jobe is also active in other areas as well. He is a Life Member of the American Institute of Chemical Engineers and the (formerly ISA) International Society for Measurement and Control (serving twice as President of the Idaho Section) and a member of the Idaho American Nuclear Society professional societies.

His profession is not his only passion. Music has been a major part of his life since his youth in Lead, where he began his interest for music playing clarinet in the Lead High School and Homestake Bands. “I played in orchestras in every place I lived.” Jobe commented, “I’ve been playing for 40 years, I’ve played my 40th year with the Idaho Falls Symphony.” He was also a violinist in various orchestras including Lead and Rapid City, South Dakota, Whiting and East Chicago, Indiana, Moscow and Idaho Falls, Idaho. He also served twice as President of the Idaho Falls Symphony, Inc., once when it was first incorporated and a second time when it sponsored the string program in the local schools.

Next in avocation priority is ballroom dancing with his wife, Lorraine Lucier. They are still dancing twice a week. Other interests include photography, hunting, fishing, hiking, cross-country skiing, and rafting.



while on campus for

# Celebrate! It's Better to Even on yo

When John Colgan (EE '42) turned 80 years old on December 28, 1999, he celebrated his birthday in an unusual way. While many people celebrate their "landmark" birthdays by having parties and accepting gifts from friends and relatives, John, perhaps due to his humble beginnings, took a different approach. Heeding the motto "It's better to give than to receive," he visited the SDSM&T Foundation and gave a gift of more than \$1.1 million to the school. This gift, given through a charitable remainder unitrust, will eventually be used to fund The John Colgan Scholarship.

John Colgan was born in Rapid City, South Dakota, in 1919. He was raised in the Spring Creek area, and he was educated at the country school. John grew up in a family of eight children, but he never realized until much later in life that his family was poor. Thinking back to his youth, John has memories of his family trying to be as conservative as possible to help make ends meet. He recalls that he was not allowed to wear his shoes during the summer months; they were taken away to prevent extra wear and tear and were not given back until school started in the fall.

John graduated from Rapid City High School in 1937 when families from coast to coast were suffering economic hardship. Although he did not have a set plan for his future, he decided to enroll at the School of Mines; he received a Bachelor's degree in electrical engineering in January 1942. After graduation, he accepted a position with General Electric (GE) where starting engineers were paid 85 cents per hour. He moved to Fort Wayne, Indiana, and worked in the Engineering Test Program with motors and generators.

John's next assignment with GE resulted in a transfer to Lynn, Massachusetts, where he worked with turbines and generators. The demand for ocean-bound Liberty ships powered by turbines and generators had increased dramatically due to German U-boat activity sinking supply transports. Because production of turbine generators was viewed as a critical war effort, personnel and manufacturing facilities were highly protected. John recalls much effort going into camouflaging the manufacturing plant to protect against the threat of enemy bombing and sabotage during World War II.

After the war, John went to GE headquarters in Schenectady, New York, and he worked in the consulting and engineering laboratory with circuit breakers and industrial control equipment. He then transferred back to Indiana where he chose to work with specialty transformers.



Foundation staff (L to R) Mandy Hubbard, Sandy Carlsson, Sanna Asmussen, and Carrie Christenson celebrate John Colgan's 80th birthday on December 28, 1999.



# Give Than to Receive

## ur Birthday



Photo courtesy of SDSM&T Foundation

on, Lana Thom, President Rod Pappel, Val Napier,  
Colgan's eightieth birthday with him and his wife Betty on

In 1948, John left GE and returned to Rapid City to work for Montana Dakota Utilities. In 1950, John and another SDSM&T graduate formed a partnership and started a consulting engineering company. In 1962, John decided to semi-retire, and he began ranching. He purchased his parents' place on Spring Creek and acquired the surrounding land piece by piece. In 1990, he purchased the Two Rivers Ranch, a 13,000 deeded-acre ranch with 4,000 additional acres of leased Bureau of Land Management land. It was the gift of this ranch that formed the principal of the charitable trust that will eventually fund the Colgan Scholarship. John and his children still own and operate the Spring Creek Ranch that is now a sizable ranch located between Rapid City and Hermosa. During his high school years, John met Laura Watson (whose dad, Carl Watson, was head of the physics department at the School of Mines for many years). John and Laura were married in June 1942 and had six children: Tom, Jim, Judy, Dan, Bob, and Betty. Laura passed away in 1983. In April 1984, John married Betty Lazor and they currently reside in the Spring Creek area. At 80 years old, John is still ranching full-time yet considers himself semi-retired.

John is a longtime member of the Pennington County Planning Commission as well as a member of the South Dakota Stock Growers Association, South Dakota Farmers Union, Canyon Lake Senior Citizen Group, and Our Lady of Perpetual Help Catholic Church. John also has many family ties to SDSM&T. Three of his sons and one son-in-law have SDSM&T degrees, and two of his grandchildren are currently enrolled at Tech.

Colgan's grandfather owned and ranched in the Spring Creek area and played an important role in John's life. His grandfather never drove a vehicle; therefore, Colgan spent his high school years as his driver. During that time, John absorbed much of his grandfather's 93 years of wisdom about business and life in general. Colgan credits his grandfather as much as his degree from SDSM&T to his success in life.

The John Colgan Scholarship will be used to support students from agricultural areas. Colgan stated, "By starting this scholarship fund, I hope to help other rural South Dakota kids complete their education at the School of Mines."

He added, "The majority of my livelihood has come from the land. Giving the ranch provides an opportunity for me to recognize this fact and return something back to future generations that come from the same background."



# Tech Paleontologists

## Dig Down Under for Fossils

--Excerpts from Dr. Jim Martin's Field Journal.

The invitation came unexpectedly. I had known Dr. Judd Case, a professor of biology in California, from our work together during two field seasons in Antarctica, but the invitation to collect fossils from Australia came as a surprise. In Antarctica, I had been invited principally to study the fossil reptiles from the end of the Age of Reptiles 65-70 million years ago. The expedition to the Australian Outback was to collect from the middle part of the Age of Mammals (24 million years ago) and to find fossil marsupials that might be the ancestors of the living pouched mammals of Australia. We were to investigate the Lake Palankarinna area two days drive north of Adelaide near Lake Erye. Judd also asked if any students might wish to go and conduct research on some of the specimens. I asked one of our Master's students in vertebrate paleontology, Rob Meredith (Paleo, Norristown, PA), if he might be interested. He was, and with monies that were awarded to me last year from the Royal Geographical Society of London and the Discovery Channel, we were off!

In early June, we flew to San Francisco where we met Judd and one of his colleagues Dr. Carla Bossard, who with two students, Steve and Elyn, intended to conduct studies of plant ecology on the Outback. Judd brought two other students, Lauren and Arian, interested in paleontology, bringing our field crew to eight. After a long flight, we ended up in Adelaide, where we met Dr. Nevelle Pledge, Curator of Fossils of the South Australian Museum. Dr. Pledge had long worked on mammals from the area and had worked successively with R.A. Stirton, University of California, Berkeley, who originally found the fossils in the area in the 1950's; with his students, Dick Tedford, now of the American Museum of Natural History and



*Photos courtesy of Dr. Jim Martin*

*Dr. Judd Case, Robb Thredith, Arian Brackett, and Dr. Jim Martin working together in the Outback of Australia.*

Mike Woodburne, University of California, Riverside; and now with Judd from St. Mary's College. Judd had been introduced to the area by Mike Woodburne when Judd was his graduate student. We were following in the footsteps of a long, and distinguished list of North American researchers. As had been tradition, we could retain specimens which were not representative of newly discovered animals. These latter specimens, known as type specimens, were to be housed with Nevelle at the South Australian Museum.

We picked up two diesel powered four-wheel drives, loaded food and water for two weeks and headed north for a two day drive to the field area on the Etadunna Station, a ranch of more than a million acres. The farther north we drove, the worse the road became. From pavement to gravel, with large road trains (tandem trucks) that hurled gravel into windshields. No culverts; only dips in the road for water drainage, and the dips could be treacherous, especially when flooded. We went over grids (cattle guards) and saw many signs for kangaroo crossing, and remains of some that didn't make it. We stayed the first

night in Hawker, near the area where the ancient (Precambrian) Ediacara fauna occurs. As we traveled north the next day, we saw emus and kangaroos until we came to the last town, Maree. Maree was a camel train destination in the days when camels supplied the ranches from Maree to Birdsville and north into the Simpson Desert. In fact, it was not until 1939 that the first successful crossing of the Desert and south to Maree was made by C.T. Madigan. Madigan even brought a paleontologist, H.O. Fletcher, on the expedition! Madigan's success was due to the use of camels, and they became the major transport for supplies until World War II. During this time, some animals escaped or were released into the desert, and they are now found in the wild. I really wanted to see a wild camel having collected so many fossil camels in North America.

The farther north into the desert we drove, the more it looked like where I grew up in the Edgemont-Provo area of South Dakota. The plants were different species, but they reminded me of sagebrush and rabbit brush. Sheep and cattle were



common, but the kangaroos instead of pronghorn reminded me of where I really was.

We finally came to the Cannuaukarinna Bore, a drill hole that provides water to the livestock over a large area. The water comes from the ground nearly boiling, making it dandy for bathing and washing clothes. We took off cross country to the Lake Palankarinna area which lies in the middle of sand dune country. Each day, we crossed these dunes and never got stuck once! We pitched camp in an area with trees a few miles from the Lake so we had ample firewood. For the entire time, we cooked on an open campfire, making everything from pancakes to scones. As soon as we got out of the trucks, the flies attacked. Fortunately, they don't bite, but they annoy one to distraction.

We got our first glimpse of Lake Palankarinna. Obviously, water was present in rainy times, but it was now a dry, salt-caked flat with winds blowing dust. Along the shore are low erosional bluffs in the otherwise sand dune-covered flats. These bluffs are the Etadunna Formation, a succession of old lakebeds that were deposited at the end of the Oligocene. Our goal was to prospect these rock layers to find fossils weathering out of the old lakebeds. Most of the creatures that lived when these layers were deposited were relatively small-pouched mammals. Some of the largest creatures of the time only had a skull eight inches long, very different from our large rhinos and giant pigs that lived at the same time in South Dakota. We had to crawl across these bluffs to find such small fossils, and our ultimate goal was to find jaws and teeth of these primitive mammals. These elements are the most diagnostic and would tell us if they were or were not the ancestors of living marsupials such as koalas, kangaroos,

pygmy marsupials, or bilbies (a rabbit-like marsupial now endangered.)

My first mammal find was a kangaroo tooth from a rock unit higher than the Etadunna Formation; a kangaroo that lived about 10 million years ago.

From the Etadunna Fm., itself, we began finding numerous remains of fish, including catfish and lungfish. Fish would be the most abundant group noted during our field expedition. We also found numerous crocodilian remains, indicating that the area was warm and moist, unlike the desert environment of today. I was not expecting to find many fossil birds. Because bird bones are hollow and delicate, they often do not fossilize. However, in these lake sediments, birds were common. They probably came to nest along the lake, a situation very similar to a site we are studying at Fossil Lake in southern Oregon. In fact, the paleoenvironmental similarities are amazing, even though they were formed more than twenty million years apart. Most birds are shore birds, and they will be studied by one of our students, Kata McCarville (Paleo, Black Hawk).

During the second day crawling in the dirt of the Tedford Locality, we struck pay dirt. One of Judd's students found a beautiful lower jaw of what we later learned was a new species of bilby. The jaw was exquisite and was the envy of us all. With renewed enthusiasm, we all crawled on. But we found only more fish and crocodilians. I did find what appeared to the tips of worn crocodilian teeth



*Paleontologists search for the ancestors of these kangaroos and other marsupials.*

the tips of roots of mammal teeth. On the opposite ends, I found enamel tooth crowns in the upper jaw of one of the larger mammals to have lived at around the ancient lake. We are just beginning to study this specimen. Both of these jaws came from very low within the rock layers, indicating they are older than most specimens previously collected from the Etadunna Formation. Therefore, these specimens and others quarried later, represent some of the earliest known marsupials from Australia.

We traced this productive layer south to an area where we found a concentration of fossils at the Young Bucks Quarry. We excavated into the hillside for many days, fighting the wind and flies. We found numerous fish, turtle, crocodilian, and well preserved birds specimens. Rob made the find of the quarry; a beautiful lizard jaw, only a half inch long. Most of the teeth were still intact, and much of the structure of the lower jaw was preserved. When we returned to the South Australian Museum many days later, we compared it to skins, the most abundant forms of lizards in Australia and believe that we have found their ancestor, a new species. However, we did not find another mammal jaw as we had hoped. Nevertheless, the layer was very productive, so we gathered all the left over dirt we had dug and hauled it to the bore pond. Here, we washed the dirt through screens and kept the remaining bones. We then picked through this concentrate to find anything missed during the initial excavation. As usual, this method produced significant fossils.

Because it was winter in Australia, Judd told us that we wouldn't have to worry about snakes, such as the deadly brown snake. The weather was often cool and windy, but during the middle of the day, it was warm in the desert. The flies were



*Shingle-backed lizards were among the many fauna the field team encountered.*

peeking from the ground. I took the whole specimen out in a plaster jacket to protect it until I could inspect it in a controlled environment. That came many days later in a hotel room on Bondi Beach in Sydney. Much to our surprise, my tooth tips turned out to be



Photo by Jeanne Apolseth

Hardrocker football team members execute drills with future football stars during the summer football camp.

## SDSM&T REACHING OUT

*The South Dakota School of Mines and Technology has a firm belief in partnering their faculty, staff, and students with communities, businesses, and K-12 educational organizations throughout the region.*



Scientific Knowledge for Indian Learning and Leadership (SKILL) gather for a picture during the

File photo



*SDSM&T was selected as the August winner of the Rapid City Area Chamber of Commerce Beautification Award. Tech was selected because of the excellent landscaping on the median in front of Surbeck Student Center. This median project was designed by Ryan Houdek (CEng '95).*

Quarterly 12 SDSM&T





*File photo*

*their four-week residential program in the summer.*



*Photo by Jeanne Apelseb*

*KNBN News team reports and rappels on ROTC activity.*



*Photo by Jeanne Apelseb*

*Curt Johnson (right) presents Dan Wisniewski, Secretary, State of Wisconsin School and Public Lands, with a replica of a T-rex jaw during the recent Western Land Commissioners Conference held in Rapid City and at SDSM&T.*

*Photo by Jeanne Apelseb*



*A program participant readies her rocket for launch at the Children's Science Center Water Rocket/Explore Flight summer program.*



# TECH DETERMINED TO DOMINATE DAC-10

**S**DSM&T has kicked off the 2000 fall sports season with the start of the newly formed Dakota Athletic Conference (DAC-10). The end of an era in college athletics in the Dakotas on June 30, 2000, has also signaled a new beginning.

When the North Dakota College Athletic Conference (NDCAC) and the South Dakota-Iowa Conference (SDIC) closed the books on a long and historic run in college athletics, six North Dakota schools and four South Dakota schools began a new tradition with the official formation of DAC-10.



The DAC-10 Conference consists of ten members. Joining the conference from South Dakota are South Dakota School of Mines and Technology (Rapid City), Black Hills State University (Spearfish), Dakota State University (Madison), and Huron University (Huron). The six North Dakota schools include Dickinson State University (Dickinson), Jamestown College (Jamestown), Minot State (Minot), Mayville State University (Mayville), University of Mary (Bismarck), and Valley City University (Valley City). "The conference is comprised of seven state supported schools, two private schools, and one for-profit school," said



Hugh Welsh SDSM&T Athletics Director. "This ratio gives us a little more "commonality" than we had with the SDIC where there were only three state supported schools out of the eight in the league."



"The conference is a result of an excellent group of people coming together with a spirit of cooperation," said Dr. Richard Gowen, President of SDSM&T. "This is an exciting continuation of the traditions that we have enjoyed at the SDIC. The DAC-10 will offer excellent advantages that will come to all of our programs through the new conference, and will provide an opportunity to schedule competitions between ten universities."



The formation of the DAC-10 means that all ten schools involved have spent the summer setting rules and schedules for the start of the fall 2000 season when DAC-10 began its first year of competition. The new conference will sponsor



competition for men and women in the following sports: football, volleyball, men's cross country, women's cross country, golf, men's basketball, women's basketball, wrestling, men's track and field,

women's track and field, baseball, and softball. Not all conference members will field teams in each sport.

Welsh commented, "The DAC-10 will make scheduling easier for all of our sports, especially football, because of the added number of schools. We will have nine conference football games so we will only need to schedule one non-conference game. A ten team conference assures the league of two entries to the men's and women's national basketball tournaments—we were previously guaranteed only one." Welsh continued, "I am in favor of the conference. I am very concerned that we will lose our traditional rivals from the SDIC, although we are trying to play a number of those schools in basketball and volleyball in our non-conference schedule."



Tech Lady Rockers volleyball team won the first DAC-10 Conference match in August when they defeated Minot in three out of five games. Volleyball Coach Mettile commented, "This is our first conference win. To do that on the road shows the heart of this team. Great play all around!"



The DAC-10 governing body is the Board of Directors, which is made up of the presidents of the ten institutions. The Board of Directors elected Dr. Jerry Tunheim of Dakota State as the DAC-10 president, Dr. Lee Vickers of Dickinson State as Vice President, and Dr. Tom Flickema of Black Hills State as Treasurer. "I am excited about the formation of the DAC-10 conference," said Tunheim. "It is my opinion that we will be one of the premier athletic and academic conferences in the National Association of Intercollegiate Athletics (NAIA)." LaVern Jessen of Dickinson was named as DAC-10 commissioner. "I am looking forward to the challenge of getting the conference off to a smooth start," said Jessen. "I have received nothing but positive comments about the new conference." Eric Sand of Jamestown was selected Chair of the Faculty Athletic Representatives Council. The Faculty Athletics Representatives Council is primarily responsible for certifying the eligibility of the athletes on their campuses. Al Bortke of the University of Mary was chosen Chair of the



Athletic Directors Council.

To keep coaches, players, alumni and fans abreast of conference activities, the DAC-10 has created a website located at

[www.dac10.org](http://www.dac10.org).



DAKOTA ATHLETIC  
CONFERENCE





# Golden Navigator Migrates to Rapid City

Six SDSM&T students have found the welcome mat out at Golden West Tele-Tech in Rapid City. Golden West hired the Tech students last spring to staff their new Rapid City-based help desk, a part of their Golden NaviGator customer service. According to Mark Gustaf, Customer Service Manager at Golden West, the student hiring was a result of a brainstorming session within the company to determine where talented, computer literate employees with flexible schedules could be located to man the new help desk.

When explaining how he initially came in contact with the SDSM&T students, Gustaf says, "It was kind of a domino effect. One of our employees - Charles Merrill - who was a Tech student at the time, contacted Dr. Antonette Logar, Chair and Professor, Department of Mathematics and Computer Science, and she announced during her classes that we were interested in hiring students for the openings. The next thing I knew I was getting resumes and job applications from some very qualified individuals from Tech."

Some of the factors that Gustaf feels make Tech students ideal candidates for these positions are flexible schedules, willingness to learn, and the ability to absorb new information. "Specifically with the School of Mines students we hire, I know

customer problems." Gustaf feels that the potential for expansion for Golden West in the Rapid City area is unlimited. "Already we have thirteen people staffing our 24-hour help desk, and this is the slow season." Gustaf says, "When school starts up again, things really start hopping." Golden West Tele-Tech is well prepared for future expansion. Gustaf has the equipment available for a total of twenty-two workstations ready to go.

In addition to their success with running the help desk, Tech students also impressed Gustaf with the work they performed when the telephone answering service at Golden West was recently updated. "The students were invaluable during the cut over to the new equipment for our answering service." Gustaf says, "We just didn't have the manpower to transfer all of the accounts out of the old system into the new, so they did all that work. And they were here during the entire interim period getting things fixed, making sure the computers were all running."

Feedback concerning the 24-hour help line has been very positive. While Golden West's former help desk was situated in Prince Edward Island, Canada, he feels that the 8300 South Dakota internet customers that are served by Golden West feel more comfortable talking to someone in their home state when they call for help.



that they are going to the Mines because of their interest in Computer Engineering, Computer Science, or Mechanical Engineering and that they not only have an aptitude for computers, but a real desire to learn while they are here," Gustaf explains.

Mark Gustaf is extremely happy with the cooperation. "These students are fantastic and have been doing a great job. They are incredibly bright," he explains. Gustaf is looking forward to working with more of the Tech students in the future. He anticipates a need for even more students to work at the help desk.

Gustaf also notes that there is a good possibility for the students to be employed by Golden West as full-time employees after graduation. "There will be many opportunities simply because Golden West Tele-Tech is becoming involved in so many different areas at this time," notes Gustaf. "Broadband access of the Internet is going to be a very big item in the near future. And at Golden West we will soon be providing local telephone service along with broadband access." The possibility of other co-ops using the Golden West help desk is also being considered. "Nearly every Internet provider struggles with running an Internet service and at the same time supporting customers, especially during start-up." Gustaf remarks, "It is extremely beneficial if they can use an already established support service to answer questions and solve

Zane Green (Math, Sundance, WY) is one of the Tech students who has worked as a Technical Support Representative at Golden West since May. According to Green, Golden West is an ideal place to work. "I am really excited about the kind of things that the company is doing. I don't know of many companies that let you try new stuff, and let you run with it."

As he explains, "James Devine (CEng, West Hartford, CT), Andrew Wallinger (CEng, Boise, ID), and I have started putting together web pages for companies as well. It is great to have the freedom to suggest new projects, have the company listen, and then be allowed to experiment."

Zane feels that the experience gained at Golden West will be valuable regardless of the profession he chooses. He hasn't yet decided if he will continue working in this field but states, "I have to say that I would like to work for a company again that has such great people to work with and such a good attitude as Golden West has."

The other South Dakota School of Mines and Technology students currently staffing the Golden West Tele-Tech help desk in Rapid City are Paul Blomstrom (ME, Rapid City, SD), Andrea Johnson (CSc, Aberdeen, SD), and Ryan DeSmet (CEng, Gregory, SD).



# Supply of Tech Grads Sparks Expansion to Rapid City

Founded by a group of Electrical Engineering graduates from SDSM&T in the early 70's, Martin and Associates, Inc., is based in Mitchell, South Dakota, with a branch office located in Rapid City, South Dakota. Martin and Associates chose the Rapid City location not only because of the natural beauty of the Black Hills and the recreational opportunities there, but also because of high technical competence of graduates from the local universities. SDSM&T contributes to the pool of these resources with its high level of computer science and computer engineering graduates. The availability of seasoned professionals in the area who are willing to accept the challenges associated with working in a fast-paced growth industry also contributed to their decision.

"Martin & Associates has found that SDSM&T does an excellent job in preparing their graduates for the marketplace. We are fortunate to be able to work so closely with the placement office in obtaining highly-skilled graduates," remarked David Springhetti (ME '73), Branch Manager of the Rapid City office.

Kelly Commet (CSc '00), Software Developer at Martin & Associates noted, "Attending the School of Mines gave me an exceptionally solid technical foundation, which as I quickly found out is the primary prerequisite for successful entry into the 'high tech' job market." Born and raised in Rapid City, Commet said it was a huge bonus to be able to stay in the Black Hills and pursue her career.

The Rapid City branch currently employs 30 associates, 26 full-time, and four on a college internship. All four of the interns are currently SDSM&T students, and 16 of the 26 full-time employees are SDSM&T graduates. "As you can see, we definitely do have a strong connection with SDSM&T, and will continue to actively recruit students from Tech and the other colleges in the area," said Jodi Friedel, Office Coordinator and Human Resources Representative.

Martin and Associates provides engineering, management information systems, specialized accounting, and organizational consulting to the

telecommunications industry. Martin and Associates have resident experts in every area of the industry. As a result, the services rendered by Martin and Associates aren't spurred by a narrowly focused, quick-fix strategy. They are drawn from the long-range perspective of a company of integrated engineers, consultants, and computer specialists. Starting with only six staff members in 1971, they currently employ more than 250. Clients include telephone, cable television, cellular telephone, and electric utilities - some of the highest growth industries in the nation. Due to growth, employee numbers are expected to increase.

Software developers are responsible for all phases of analysis, design, development, maintenance, and initial testing of software products. Depending upon motivation and ability, opportunities to advance in the field are available in all areas. Software developers work on DEC Alpha, NT, and PC platforms using the latest programming technologies. Martin and Associates is in the process of developing n-tier client-server software to meet the needs of the telecommunications industry. Visual Basic, C++, OOP, MS-SQL, Sybase, and Windows NT are programming tools being utilized in this development.

The newest addition to the Martin and

Associates software packages is the Universal Billing System (UBS), released on June 1, 2000. This product will target Competitive Local Exchange Carriers (CLEC's) that have 20,000 to 100,000 access lines. David Mattox (CEng '95), Software Engineer with Martin and Associates indicated, "Our current challenge is to migrate the billing program to a Windows NT platform, and it's going very well. The Rapid City office was created to support this expansion." Associates are assigned to teams of highly motivated programmers with varying levels of experience and background.

*continued on page 20*



**Martin & Associates, Inc.**

*Engineering. Consulting. Computer Solutions.*

*Photo by Jeanne Apelseth*



*Employees of Martin and Associates, Inc., in Rapid City, South Dakota, stand together outside of the workplace.*



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# Then &

The 28 year period spanning from 1973 through 2000 saw many changes for Tech.

The 2000 renovation brought a new look inside and outside of the Civil and Mechanical Engineering Building, as well as a lightweight concrete canoe. Cultural diversity is still a proud tradition that SDSM&T has maintained and the campus radio station is still going strong.

## Radio Station

SDSM&T's KTEQ radio station went on the air for the first time in the seventies, and is still strong on campus today. KTEQ offers student involvement at all levels.



## Civil and Mechanical Engineering Building

Originally, the Civil and Mechanical Engineering Building was designed with a wall separating the two departments. The 2000 renovation allowed the walls to be removed so that the two departments share the same laboratories and work together on interdisciplinary projects.

*File photo*



*Photo courtesy of SDSM&T Archives*



*Photo by Jeanne Apelseh*





# & Now



## Concrete Canoe

When the concrete canoe team participated at Nationals in 1990, the SDSM&T “Revenge” canoe weighed in at approximately 290 pounds. This year Tech’s “Looking Glass” canoe weighed in at about 70 pounds, which was the lightest canoe at Nationals.



Photo courtesy of Dr. M.R. Hansen

## International Students

As in the 1970’s, the tradition of cultural diversity is still celebrated on Tech’s campus many decades later. This year there were booths from Brazil, Norway, Latin America, India, China, Zambia, Japan, Bangladesh, and the AISES group at the Cultural Expo held on campus in April.



File photo

Photo courtesy of SDSM&T Archives



Photo by Tiffany Smith



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*continued from page 17*

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## STUDENT SPOTLIGHT

A new leadership recognition program, The Leadership Hall of Fame, has been established at SDSM&T. The Hall of Fame was created by the Leadership Development Team for the purpose of raising awareness on campus of the importance of student leadership and to recognize the many valuable contributions student leaders make. Any full-time student at SDSM&T, who is in good academic and disciplinary standing, is eligible to apply for induction to the Leadership Hall of Fame. Applications are reviewed by an anonymous committee of students, faculty, and staff, appointed by the Director of the Surbeck Student Center and the Vice President of Student Affairs and Dean of Students. Each year up to six students are selected for this honor. The following SDSM&T students were inducted into the Leadership Hall of Fame for the year 2000: **Chris Ahlers** (CEng '00), **Brianna Griffith** (Geol, Escondido, CA), **Ken Harding** (ME, Garden City, SD), **Cory Jensen** (ChE '00), and **Angie Monheim** (BS EE '98, MS EE, Rapid City, SD).

The Research for Undergraduates program (REU) presented the results of their assigned research projects on Friday, July 28, 2000, with a Poster Session in the Surbeck Center. The REU program, which is funded by the National Science Foundation, aims to expand student participation in all types of research, and is open to undergraduate students. The program allows students to experience first-hand how basic research is carried out.



This year's REU students were **Bob Cunningham** (Che, Mitchell, SD), **Misty Rose Mousseaux** (Oglala Lakota College), **Keith Flanagan** (Che, Florence, SD), **Lindsey Peterson** (Washington State), **Danielle Smith** (MIT), **Debbie Morgan** (Chem, Rapid City, SD), and **Ryan Caldwell** (Che, Sioux Falls, SD).

## Martin and Associates, Inc.

*continued from page 16*

Team members participate in individual and group projects. Current projects last anywhere from several hours to several years. "So much of what Martin and Associates is about is its openness and teamwork. Everybody is willing to share information so that we can all move faster and work more creatively," Commet said. "Working for a small company with the feel of a big company gives you a taste of both worlds," she added.

Since its inception, the company has experienced steady growth and now provides a broader and more integrated range of services than any of their national competitors. Martin and Associates has clients in more than half of the states. Currently more than 130 clients are using their customer care and billing solutions. In addition, Competitive Local Exchange Carriers (CLEC's) are becoming a significant target market. Today, the company continues to work in partnership with clients to keep networks prepared for the future requirements of advanced telecommunication applications such as Advanced Intelligent Network (AIN), video services, and Integrated Services Digital Network (ISDN).

"Working for a complete solution for our customers is what we do best," said Springhetti. "The company holds user group meetings on current software, so it is a cooperative effort between the customer and the company. The user community actually votes on all new features and updates," noted Springhetti. "We also have an in-house engineering department which is unusual," he added.

Martin and Associates is operated with the philosophy that outstanding service to clients, provided by quality individuals who are appropriately challenged and rewarded, is key to its long-term success. After more than 25 years of success and growth, they have been rewarded with many long-term staff members who have grown and prospered within the company.

Of all the organizations served, Martin and Associates is proud that 98% continue to be active clients. Their company objective is to be the premier national provider on engineering, information systems, and management solutions to the telecommunication markets they serve.





## PERSONNEL CHANGES

## Dig Down Under

*continued from page 11*

### FAREWELL:

**James Bailey**, Instructional Technology Services (6/30/00)

**Dr. Wendell Hovey**, Professor, Civil and Environmental Engineering (6/30/00)

**Dr. Srinivasa Iyer**, Professor, Civil and Environmental Engineering (6/30/00)

**Harold Orville**, Institute of Atmospheric Sciences (6/30/00)

**Kari Larese**, Public Information Manager, University and Public Relations (7/5/00)

**Patrick Fleming**, Instructor, Mathematics and Computer Science (7/7/00)

**Renee Froelich**, Printing Services (7/19/00)

**Nan Halvorson**, Senior Claims Clerk, Student Accounts/Cashiering Office (7/21/00)

**Shane Stephen**, Assistant Football Coach, Intercollegiate Athletics (7/26/00)

**Jenny Mathison**, Admissions Counselor, Academic and Enrollment Services (8/8/00)

**Mary Angela Milne**, Little Miner's Clubhouse (8/16/00)

**Rebecca Cronin**, Little Miner's Clubhouse (8/31/00)

**Sharon Colombe**, Financial Aid Director, Academic and Enrollment Services (9/7/00)

### WELCOME:

**Darlene Uivestad Gregg**, Senior Claims Clerk, Student Accounts/Cashiering Services (6/19/00)

**Dr. Bradley Baker**, Assistant Professor, Institute of Atmospheric Sciences (7/1/00)

**Ann Perry**, Assistant Director and Head Resident for March-Dake Hall (7/1/00)

**Merle Swenson**, Western Satellite Coordinator, Civil and Environmental Engineering (7/1/00)

**Melissa Jensen**, Admissions Counselor, Academic and Enrollment Services (8/1/00)

**Dr. Gregg Stubbendieck**, Assistant Professor, Mathematics and Computer Science (8/1/00)

**George Browne**, Assistant Football Coach and Assistant Intramural Director, Intercollegiate Athletics (8/2/00)

**Summer Feind**, Reproduction Services Supervisor, Tech Print Center (8/2/00)

**Eric Waldstein**, Assistant Football Coach and Weight Room Supervisor, Intercollegiate Athletics (8/2/00)

**Connie Bruch**, Senior Claims Clerk, Business and Administration (8/7/00)

**Daniel O. Abraham**, Instructor, Civil and Environmental Engineering (8/16/00)

**Lonnie Hosman**, Instructor, Social Sciences (8/16/00)

**Michelle Kleinheksel**, Instructor, Mathematics and Computer Science (8/16/00)

**Dr. Dianna Knox**, Head Resident for Palmerton Hall (8/16/00)

**Dr. Howard Peterson**, Professor, Social Sciences (8/16/00)

**Barbara Preszler**, Instructor, Mathematics and Computer Science (8/16/00)

**John C. Quinn**, Assistant Professor, Social Sciences (8/16/00)

**Dr. Mitchell S. Stone**, Assistant Professor, Social Sciences (8/16/00)

**Michael Strub**, Instructor, Civil and Environmental Engineering (8/16/00)

**Jill Trimble**, Instructor/PRIME Program Coordinator, Mathematics and Computer Science (8/16/00)

**Dr. Patricia Mahon**, Vice President for Student Affairs and Dean of Students (8/21/00)

**Amy Bauer**, Humanities (9/1/00)

**Leonard Carr**, Faculty/Staff Lounge Cook (9/8/00)

**Kevin Cooper**, Instructor, Mathematics and Computer Science (9/1/00)

**Ione McCloskey**, Staff Assistant, Residence Life (9/15/00)

### CHANGE IN POSITION:

**Carolyn Brich**, has transferred to Electrical and Computer Engineering as a secretary effective August 30, 2000.

**Donna Kliche**, transferred to IAS as a Research Scientist I.

everywhere until dusk at about five o'clock. I think someone must have blown a whistle and the next shift, the mosquitoes took over. We were a little concerned about the poisonous spiders that Australia is famous for, but Rob really wanted to see a brown snake. Judd told us that if we started seeing large lizards that it was warm enough for snakes. Of course, not long after this pronouncement, we found a large bearded lizard, about a foot and a half long. Fortunately (from my viewpoint), we never did encounter a brown snake, but we did see a number of shingle-backed lizards. These large skinks look very much superficially like Gila monsters, but are not poisonous. Their scales are large and interlock for protection, and their tail is short and bulbous, appearing similar in shape to their heads so a predator could be fooled. They do hiss and spit out a long blue tongue to intimidate attackers, including us.

We spent most of the remainder of our time quarrying the Young Bucks Quarry. During one of our last trips to the quarry, Rob and I finally got to see a camel. A large male stood looking at us trespassers, and seemed none too happy when we came racing up to take pictures. He turned away and was almost swallowed up by the desert, but at least we saw him!

As a result of the quarrying operation, we had numerous bags of concentrate to sort through. We sorted much of the material in camp during the evenings, but some came back to the U.S., and Rob sorted through most of the material. His efforts paid off. He found a new species of pygmy possum, a feather glider, and a bandicoot. Overall, we found at this point at least four new species of marsupials, most of which are ancestral forms, and one of the oldest lizards from Australia. We look forward to opportunities to continue our research in the future.

The Museum of Geology will host a special Australian event on Saturday, November 4, 2000. Contact the Museum at (605) 394-2467 for additional information.



## RESEARCH NOTES

Associate Professor **Dr. Lee Vierling**, Institute of Atmospheric Sciences, was awarded \$300,000 from the National Science Foundation for a project entitled "CAREER: An Integrated Research/Educational Plan to Develop and Deploy a Pointable, Hyperspectral Remote Sensing Instrument on a Tethered Balloon."

Associate Professor **Dr. Andrey Petukhov** and **Dr. Mikhail Foygel**, Chair and Professor, Department of Physics were awarded \$312,000 from the National Science Foundation for a project entitled "Spin-Dependent Transport in Magnetic Nanostructures and Heterostructures."

**Dr. David Boyles**, Professor, Department of Chemistry and Chemical Engineering, and **Dr. Jon Kellar**, Chair and Professor, Department of Materials and Metallurgical Engineering received \$330,000 for their project entitled "Direct Formation of Silane Coupling Agents on Glass Surfaces for Improved Composite Performance" from the US Air Force.

**Dr. Jon Keller**, **Dr. Lidvin Kjerengtroen**, Professor, Department of Mechanical Engineering, and **Dr. William Cross**, Research Scientist III, Department of Materials and Metallurgical Engineering, received \$270,000 from the United States Air Force for their project "A Fiber-Optic Sensor System for Total Lifetime Monitoring of Polymer Matrix Composites." The three were awarded \$65,000 in additional funds for their project "A Multi-Scale Approach for Understanding the Role of the Interphase in Polymer Matrix Composites" from the National Science Foundation.

**Dr. Keller**, **Dr. Daniel Heglund**, Assistant Professor, Department of Chemistry and Chemical Engineering, **Dr. Lidvin Kjerengtroen**, **Dr. Robb Winter**,

Department of Chemistry and Chemical Engineering, and **Dr. Sherry Farwell**, Dean, Graduate Education and Sponsored Programs were awarded \$104,498 from the National Science Foundation for their project entitled "Acquisition of a Research-Grade FT-IR Spectrometer."

**Dr. Sherry Farwell**, Dean, Graduate Education & Sponsored Programs, was awarded \$225,000 in additional funds from NASA for his project entitled "NASA EPSCoR: Preparatory Grant Proposal: He was also granted \$27,300 in additional funds for the Graduate Research Fellowship Program, and \$14,540 for his project titled "Analytical Training Program" from the Mongolian Technical University.

**Dr. Robb Winter**, Department of Chemistry and Chemical Engineering, was awarded \$147,419 for his project entitled "Nanomechanics and Interphase Chemistry of Interfacial Fracture", and \$50,000 in additional funds from the US Department of Energy for his project entitled "Investigation of the Interphase Region in Polymer Matrix-Glass Fiber Reinforced Composites Using the Interfacial Force Microscope." He was also granted \$10,050 for his project entitled "REU Site: Molecular Level Modification of Surfaces" from the National Science Foundation, and received a \$1,000 award for his project entitled "SBIR Phase O - Application of Silver Colored Micaceous Schist as an Inorganic Metallic-looking Pigment to Replace Environmentally Hazardous Aluminum Powders and Pastes" from the Pacer Corporation.

**Dr. John Helsdon**, Professor, Department of Atmospheric Sciences and Institute of Atmospheric Sciences, was awarded \$130,000 in additional funds for his project entitled "3-D Cloud Scale Model and Satellite Study of the Transport and Evolution of Lightning-Produced Nitrogen Oxides" from the National Science Foundation.

**Dr. William Roggenthen**, Professor, Department of Geology and Geological Engineering, was awarded \$117,563 from the US Department of State for his project entitled "William C. Foster Fellows Visiting Scholars Program."

**Dr. Scott J. Kenner**, Associate Professor, Department of Civil and Environmental Engineering received \$44,325 and \$60,225 from SD Department of Game, Fish and Parks for his project entitled "Development of a Multi-agency Systems Approach to Manage a Wild Brown Trout Fishery within an Urbanized Watershed, Rapid Creek, SD." **Dr. Kenner** was also awarded \$20,121 for his project entitled "Lower Rapid Creek Watershed Assessment and TMDL Development" from the City of Rapid City, and \$6,815 for his project entitled "Methodology for Wellhead Protection, Upper Sioux Tribe" from the Environmental Office, Upper Sioux Community.

**Dr. Francine Campone**, (Scientific Knowledge for Indian Learning and Leadership (SKILL), received \$100,000 in additional funds from NASA for her project entitled "Provide for Scientific Knowledge for Indian Learning and Leadership for Mission to Planet Earth."

**Dr. V. Ramakrishnan**, Distinguished Professor, Department of Civil and Environmental Engineering, and **Dr. Sookie Bang**, Associate Professor, Department of Chemistry and Chemical Engineering, and were awarded \$72,558 from the National Science Foundation (NSF) for a project entitled "Application of a Microbial Immobilization Technique in Remediation of Concrete Cracks." The two also received \$10,000 in additional funds for the project entitled "Application of a Microbial Immobilization Technique in Remediation of Concrete Cracks-REU"



from the NSF. Bang was also awarded \$4,000 from the Navel Research Laboratory for the project entitled "Development of Halophilic Bacterial Biosorbent.

**Dr. Cathleen Webb**, Associate Professor, Department of Chemistry and Chemical Engineering, **Dr. Arden Davis**, Mickelsen Professor, Department of Geology and Geological Engineering, and **Dr. David Dixon**, Associate Professor, Department of Chemistry and Chemical Engineering were awarded \$41,299 for their project entitled "Arsenic Remediation of Drinking Water" from the SD Department of Environment and Natural Resources. Dr. Davis and Dr. Webb also received \$8,029 from South Dakota State University for the project. The two also were awarded \$30,000 in additional funds from US Department of Interior-Bureau of Land Management for their project entitled "Belle Eldridge Search and Remediation Investigation."

Three professors were awarded "Governor Janklow's Faculty Awards for Teaching with Technology" from the State of South Dakota. **Dr. Charles Kliche**, Professor and Program Coordinator, Mining Engineering Program received \$25,555, **Dr. Andrey Petukhov**, Professor, Department of Physics received \$21,614.14, and **Dr. Stephen Pratt**, Associate Professor, Department of Social Sciences received \$21,991.54.

**Carrie Herbel**, Museum of Geology was awarded \$40,282 for her project entitled "Support Field Work, Lab Preparation and Curation of Paleontological Material Collected from the Pig Wallow Site, Badlands National Park" from the US Dept of Interior-Badlands National Park. She was also awarded \$26,944 from US Dept of Interior-Badlands National Park for a second project titled "Baseline Mapping of Fossil Bone Beds at Badlands National Park."

**Kata McCarville**, Director of Instructional Technology Services, was granted \$44,500 from the Board of Regents for her project entitled "Governor's Electronic Classroom Upgrade." McCarville was also awarded

\$10,000 from North Dakota State University for her project entitled "Undergraduate Research Experiences in High Performance Computing and Advanced Networking."

**Dr. Chris Jenkins**, Professor, Department of Mechanical Engineering, was awarded \$10,000 from Jet Propulsion Laboratory (prime-NASA) for a project entitled "JPL Gossamer Spacecraft Support." Jenkins was also awarded \$20,000 for a project entitled "Analysis of Optical Quality Membranes" from SRS Technologies. SRS Technologies also awarded Jenkins \$18,600 in additional funds for his project entitled "Optical Quality Membranes for Space Rate Optics."

**Dr. John Weiss**, Associate Professor, and **Dr. Antonette Logar**, Chair and Professor, both from Department of Mathematics and Computer Science received \$51,680 from Raytheon Technical Services Company for their project entitled "A MODIS Re-Projection Tool."

**Dr. Ed Duke**, Manager of Analytical Services, Engineering and Mining Experiment Station, and **Dr. Colin Paterson**, Professor, Department of Geology and Geological Engineering were awarded \$42,287 from the National Science Foundation for their project entitled "US-Namibia Cooperative Research: Potential of Hyperspectral Remote Sensing for Geological Mapping and Resource Evaluation in Arid Regions When Used in the Damaran Terrain." Dr. Paterson was also awarded \$14,737 in additional funds for his project entitled "A Black Hills Science Teaching Project to Prepare K-8 Teachers for the new Millennium" from Black Hills State University. Dr. Duke received \$3,000 from DOSECC, Inc. for his project entitled "Application of visible and near infrared reflectance spectroscopy in studies of active and ancient thermal regimes."

**Dr. James Martin**, Professor, Department of Geology and Geological Engineering, and Curator of Vertebrate Paleontology, Museum of Geology was awarded \$48,000 for his study entitled "Paleontological

Survey of US Corps Lands Along the Missouri River" from US Army Corps of Engineers.

**Dr. Larry Stetler**, Assistant Professor,



Department of Geology and Geological Engineering was awarded \$39,975 for his project entitled "Channel Bottom Cementation and Sediment Yield Effects on a Natural Spawning Habitat in Spearfish Creek, SD" from SD Department of Game Fish and Parks.

**Dr. Manuel Penaloza**, Associate Professor, Department of Mathematics and Computer Science was awarded \$36,786 from the Rapid City Regional Hospital for his project to provide consulting services to Rapid City Regional Hospital's Information Systems Department."

**Dr. Thomas Fontaine**, Associate Professor, Department of Civil and Environmental Engineering was awarded \$29,629 in additional funds from SD Department of Game Fish and Parks for his project entitled "Analysis for Restoration of Water Quality and Supply for Fishery at Yates Pond, South Dakota."

**Dr. Terje Preber**, Chair and Professor, Department of Civil and Environmental Engineering was awarded \$20,000 from the David & Lucile Packard Foundation for a scholarship grant for Shane R. Herrod.

**Dr. Kerri Vierling**, Department of



Chemistry and Chemical Engineering was awarded \$8,131 for the project "Development of a Multi-agency Systems Approach to Manage a Wild Brown Trout Fishery within an Urbanized Watershed, Rapid Creek, SD" from the SD Department of Game, Fish, and Parks.

**Dr. Alvis Lisenbee**, Professor, Department of Geology and Geological Engineering, received \$7,060 for his project entitled "Geologic Map of the Hayward Quadrangle" from USDOI - US Geological Survey.

## You Are Invited . . . CALENDAR OF EVENTS

### OCTOBER

#### Wednesday – Friday, October 4-6

Board of Regents meetings @ Tech

#### Wednesday, October 4

Women's Volleyball vs Minot State, 7pm

#### Wednesday, October 4

Boeing Award Presentation

#### Friday – Saturday, October 6-7

Women's Volleyball @ Huron University

#### Saturday, October 7

Men's Football vs. University of Mary, 1pm

Cross Country @ Rocky Mountain Shootout

#### Monday, October 9

Native American Day Holiday

#### Tuesday, October 10

Women's Volleyball vs. NAU, 7pm

#### Friday, October 13

Women's Volleyball vs. U of Mary, 7pm

#### Saturday, October 14

Men's Football @ Dakota State University

Cross Country Meet

#### Monday, October 16

National Boss Day

#### Tuesday, October 17

Women's Volleyball vs. Chadron State, 7pm

#### Wednesday, October 18

Nat'l Convention Am. Soc. Of Civil Eng.

#### Friday – Sunday, October 20-22

Tech Family Weekend

#### Friday - Sunday, October 20-22

Women's Volleyball @ BHSU

#### Saturday, October 21

Men's Football vs. BHSU, 1pm

Cross Country Meet

#### Monday, October 23

Last Day to Register to vote in Nov. elections

#### Tuesday, October 24

United Nation's Day

#### Thursday, October 26

Women's Volleyball vs. BHSU, 7pm

#### Saturday, October 28

Men's Football vs. Valley City State, 1pm

Cross Country Meet

FE/EIT Exam 7:30am

#### Sunday, October 29

Daylight Savings Time Ends – Set clocks back one hour

#### Tuesday, October 31

Halloween

Women's Volleyball @ Dickinson State

Convocation 3:30pm @ CB204W

### NOVEMBER

#### Friday – Saturday, November 3-4

All Campus Leadership Retreat

#### Saturday, November 4

Football @ Minot State

Cross Country DAC-10 Tournament

Tour Tech

Museum of Geology Australian Program

#### Sunday, Wed, Sat, November 5, 8, & 11

Volleyball @ DAC-10 Tournament

#### Monday, November 6

Men's Basketball vs. Rocky Mountain

#### Tuesday, November 7

Election Day

#### Friday, November 10

No Classes – Observance of Veteran's Day

Women's Basketball @ Mt. Marty

Men's Basketball @ Mt. Marty

#### Saturday, November 11

Women's Basketball @ Dakota Wesleyan

Veteran's Day

#### Monday – Friday, November 13-17

Early Registration Week

#### Tuesday, November 14

Men's Basketball @ Rocky Mt. College

#### Thursday, November 16

Women's Basketball @ S. Co. Tourney

Men's Basketball @ Chadron State

Great American Smokeout

#### Thursday – Saturday, November 16-18

Drama Club Fall Production 7pm

#### Friday, November 17

Last Day to Drop a class with a "W"

#### Saturday, November 18

Women's Basketball @ S. Co. Tourney

Track Meet @ NAIA Nat'l meet

#### Thursday, November 23

Thanksgiving Day – no classes

#### Friday, November 24

No classes

#### Friday – Saturday, November 24-25

Women's Basketball @ BHSU Tourney

Men's Basketball @ BHSU Tourney

#### Tuesday, November 28

Men's Basketball @ Chadron State

#### Thursday, November 30

Convocation 3:30pm @ CB204W

### DECEMBER

#### Friday, December 1

Women's Basketball @ Jamestown

Men's Basketball @ Jamestown

#### Saturday, December 2

Women's Basketball @ U of Mary

Men's Basketball @ U of Mary

American Society of Civil Engineers

Banquet, Arrowhead Country Club

#### Monday – Friday, December 4-8

Bowling for Food @ Grubby's

#### Tuesday, December 5

Parade of Trees & Open House @

Surbeck Center Ballroom

#### Thursday, December 7

Pearl Harbor Day

#### Friday, December 8

Women's Basketball vs. Dickinson, 6pm

Men's Basketball vs. Dickinson, 8pm

#### Saturday, December 9

Women's Basketball vs. Minot, 6pm

Men's Basketball vs. Minot, 8pm

#### Saturday – Sunday, December 9-10

Concert Choir & Master Chorale

Christmas Concert @ Our Lady of

Perpetual Help, 8pm

#### Sunday, December 10

All Campus Christmas Carol Sing &

Candle Lighting, 7pm Bump Lounge

#### Tuesday, December 12

Children's Holiday party, SSC Ballroom

#### Thursday – Friday, December 14-15

Board of Regents meeting - DSU

#### Friday, December 15

Women's Basketball @ Mayville U

Men's Basketball @ Mayville U

President's Graduation Reception 3-4pm

#### Friday, December 15

Symphonic Band & Jazz Concert

#### Saturday, December 16

Women's Basketball @ Valley City St

Men's Basketball @ Valley City St

Graduation @ Civic Center, 10am

#### Monday – Friday, December 18-22

Textbook Buyback

Final Exams

#### Thursday, December 21

Convocation 3:30pm @ CB204W

#### Friday, December 22

Hanukkah begins

Semester Ends

First Day of Winter

#### Saturday – Tuesday, December 23-Jan. 9

No classes – Holiday break

#### Sunday, December 24

Christmas Eve

#### Monday, December 25

Christmas Holiday

#### Friday – Saturday, December 29-30

Women's Basketball vs. SD Tech Classic

Men's Basketball Perkins Classic @ BHSU

#### Sunday, December 31

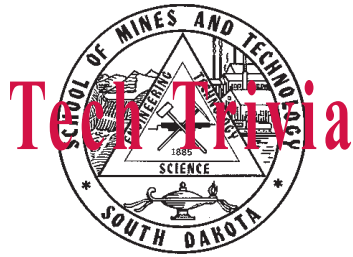
New Year's Eve

### JANUARY

#### Monday, January 1

New Year's Day Holiday





# Tech Trivia

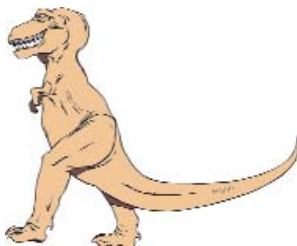
## Did you know...

### Tech Trivia

- In 1959 the Institute of Atmospheric Sciences was established at SDSM&T.



- The sixth only Tyrannosaurus rex was unearthed by the Museum of Geology in 1981. Casts of the TRex tooth are available through the SDSM&T Museum of Geology.

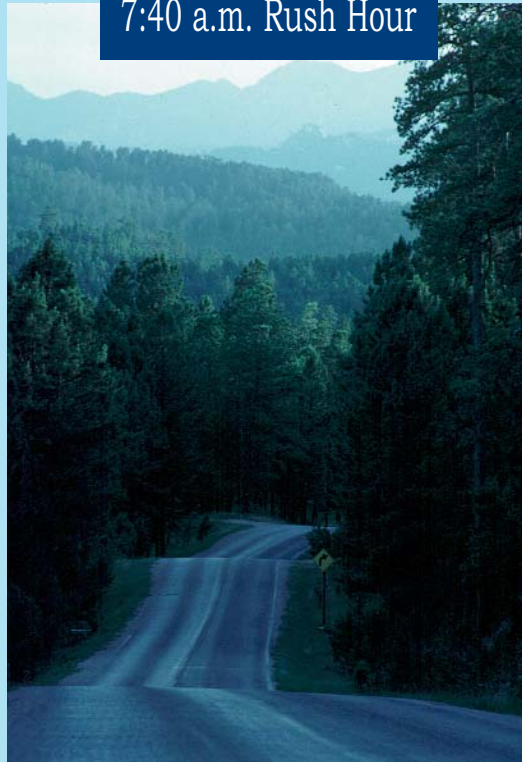


- Dr. Ken Han, professor of metallurgical engineering, was elected a member of the National Academy of Engineering in 1996. During this Fall 2000 semester, Dr. Han is the Acting Dean of the College of Materials Science and Engineering.



3,000 copies of this publication were printed @ a cost of \$1.50 each (printing costs only).

7:40 a.m. Rush Hour



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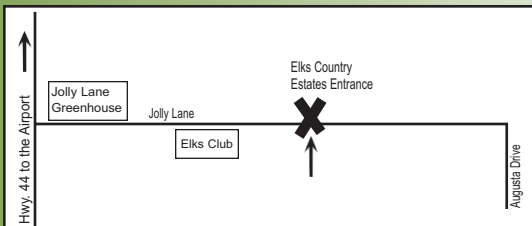
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