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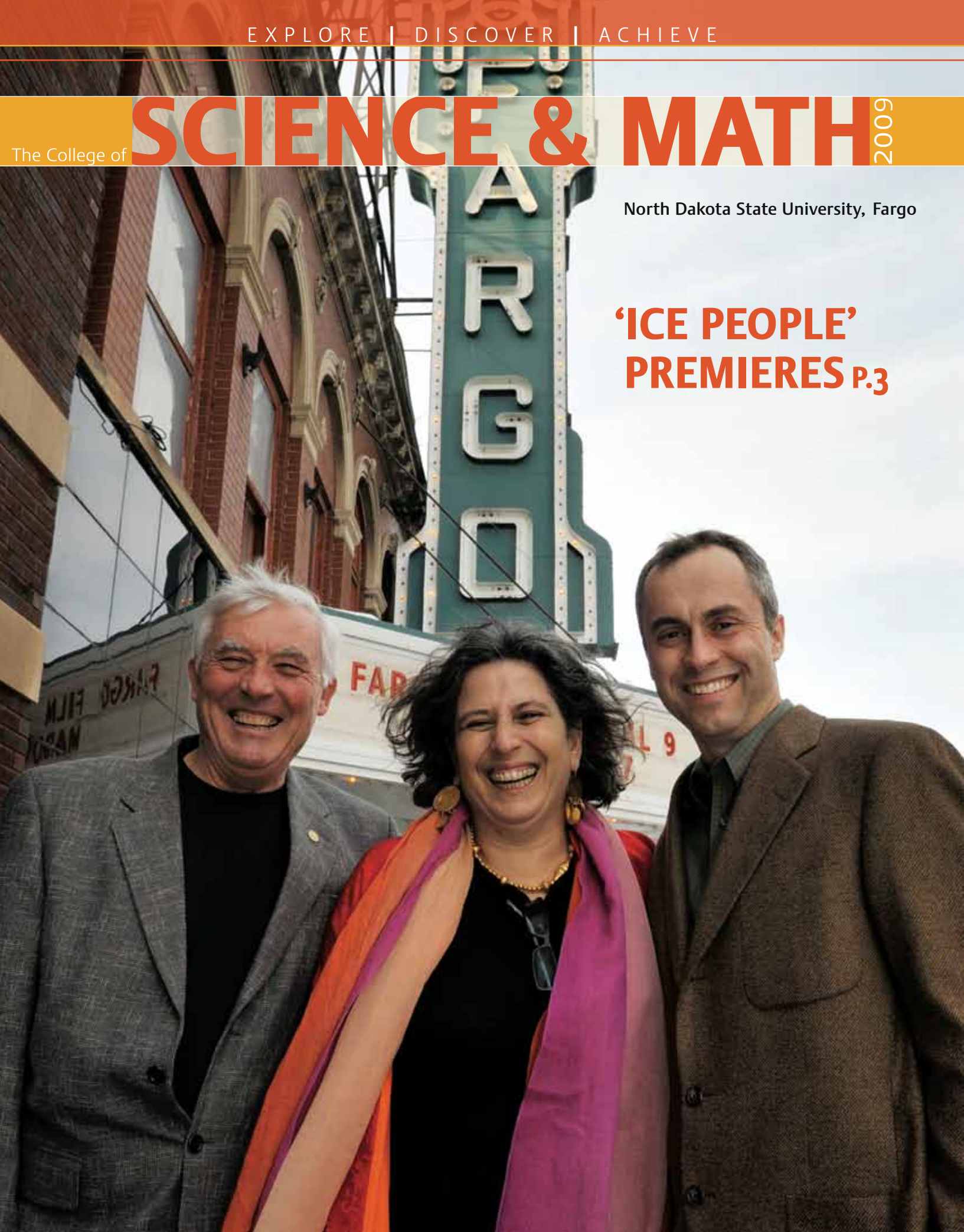
The College of

# SCIENCE & MATH

2009

North Dakota State University, Fargo




## 'ICE PEOPLE' PREMIERES P.3

# *What your* **CONTRIBUTIONS** *do*


*The NDSU College of Science and Mathematics depends on alumni contributions to provide a wide variety of services that benefit students. Each of these services acts as a puzzle piece that, when assembled, paints a picture of a college constantly striving to provide the best education to its students. While scholarships are by far the biggest benefit of alumni contributions, here are some other services your funds help provide.*

## The costs alumni cover

$50 – provides a biological sciences student with an Outstanding Student award

$100 – covers a coffee house rental for a community Science Café

$250 – helps with expenses for a student to present research at a conference

$500 – pays expenses for Darwin Days, an across-campus celebration of Darwin's science

$1,000 – brings a faculty member's mentor to campus to ease his or her transition from student to professor

$5,000 – adds to department endowment for supporting students, faculty and staff

$10,000 – endows a scholarship to provide $400 a year to attract new students

$50,000 – remodels a laboratory in the coatings and polymeric materials department

$100,000 – endows a graduate student stipend to attract the best students

$500,000 – endows a professorship in the college, increasing the chances of keeping an award-winning faculty member

$1,000,000 – provides a building addition to support undergraduate science labs

*Donations to the College of Science and Mathematics are administered by the NDSU Development Foundation.*

## Guest lectures:

The College of Science and Mathematics brings in top scientists from all over the country as well as sends out its own top professors for guest lectures. Whether bringing in or sending out, guest lectures require alumni funding for support.

James Coykendall spoke on the Rubik's Cube during a Science Café in February.

This year, the college started the Science Café series (see page 5) to take the value and fascination of science to the local community. One of the most important events that funds sponsor, according to college dean Kevin McCaul, is the Science and Mathematics Community Lecture Series. Now in its third year, this series brings in top researchers from across the spectrum of science and math to give a community talk at the Fargo Theatre. The first, Lonnie Thompson, covered climate change. The second, Brigit Stuchberry, spoke about songbirds and migration. This year's speaker was Daniel Gilbert (more on page 5).

"These are internationally known speakers who have an uncanny ability to take their science to the community in a way the community appreciates," McCaul said.

They also spend time in classrooms so students get a close-up look at an internationally known scientist.

Each department also works to bring in their own guest speakers. Psychology runs a colloquium series on Friday afternoons, and mathematics conducts a workshop each year for young girls called Sonia Kovalevsky Day, which includes national speakers.

"We couldn't run all these series without alumni contributions," McCaul said.

## Student travel:

Jeremy Brown, a Ph.D. student in computer science, traveled to Washington, D.C., in December 2007, to participate in the Institute of Electrical and Electronics Engineers Global Communications Conference. He presented a paper on wireless sensor networks—small computers with wireless capabilities.

This particular conference is the flagship of conferences for students like Brown, who will depend on such resume builders and networking to find employment in the future.

Jeremy Brown

"Anybody who's anybody in this field presents at this conference," he said.

The $2,500 cost of attending this conference was partially offset by funding provided by alumni.

Attending conferences is a crucial part of graduate student education as well as an important opportunity for undergraduates. Getting to conferences around the country would be an undue burden for many students. Alumni contributions work to bridge that gap between NDSU and other parts of the country. Undergraduate students are able to meet potential graduate-school advisers at these conferences as well as see other scientists presenting their work. For example, the average cost of attending a geosciences conference is $900. Alumni contributions can help cover $300 of that.

The Geo-Alumni Endowment is the funding vehicle of the geosciences department. Only interest from the fund is used from year to year. While most of it is used for scholarships, alumni funds also help get geosciences students into the field for course work. Almost all geosciences students benefit from the funds. This spring, they participated in field courses in Colorado and Utah. They have traveled to Death Valley, Calif.; Ontario, Canada; and northern Minnesota. They also were able to take advantage of internships by working with a geologist for a day on a drill rig in western North Dakota.

For Bernhardt Saini-Eidukat, the benefit of alumni funds is to give students the ability "to see the science in real life as opposed to a picture on a PowerPoint or a sample in a box in a lab. You really can't understand the three-dimensional aspect of the Earth and its structures without physically being there."

## Startup funds:

Erin Gillam, assistant professor of biological sciences, needed startup funds to continue her research on bats. She doesn't have a lab yet, but is gathering equipment.

Using microphones and a speaker capable of recording and projecting ultrasonic frequencies, she can observe bat calls and how they react to recordings of other bats. She is researching bats' ability to maneuver in changing environments.

Erin Gillam

"If the Navy had sonar systems that are even half as sophisticated as bat echolocation, it would be above and beyond anything they have now," she said.

Similarly, Katie Reindl, an assistant professor of biological sciences, received a start up package to purchase new equipment and laboratory supplies, support undergraduate research assistants and support part of her work in the summer. "I am able to spend the funds on a variety of different things as opposed to just equipment or just supplies," she said. "This flexibility allows me to make the best use of the money."

Start-up funding to attract new faculty like Gillam and Reindl comes, in part, from alumni contributions.

## A quick look at how departments use alumni contributions:

**Biological Sciences:** This past year the department gave out more than $12,000 in awards, both undergraduate and graduate. Some awards are monetary; others are a combination of research funds and a stipend.

**Chemistry and Molecular Biology:** scholarships and awards for undergraduate students; award for one graduate student; travel support; interviewing expenses to recruit faculty

**Computer Science:** student scholarships; student travel to professional conferences

**Coatings and Polymeric Materials:** newsletter costs; Industrial Advisory Board meetings; student recruitment; new student orientation; visiting scholars and guest lecturers; research collaboration meetings; faculty startup

**Geosciences:** scholarships; travel to conferences; field visits to different parts of the country; student internship support

**Mathematics:** Contributions not for a specific scholarship fund help support the Pythagoras Award scholarships and Rao Exam awards and scholarships.

**Statistics:** student scholarships; faculty development through workshops and conferences

**Physics:** Alumni contributions are distributed to a number of student scholarships.

**Psychology:** The department handed out 17 awards during the past academic year, including scholarships, research fellowships and graduate student conference travel.

## PRESIDENT'S MESSAGE

NDSU is an institution of choice for students, and the College of Science and Mathematics is an important player as we move forward.

NDSU's official fall enrollment stood at 13,229 undergraduate, graduate and professional students, which was a record for the ninth year in a row. A truly exciting development was the unprecedented 23 percent increase of first-year students.

Advancement is coming on many fronts across our university. We are working to diversify our faculty, staff and student body. I believe our students will not be fully prepared for a diverse, global work world if they are not part of an inclusive university environment. So, we are creating an Equity and Diversity Center and the President's Council on Global Outreach. By building partnerships around the world, we can further expand our research, enhance our educational offerings and help the economy of our great state.

In my State of the University Address, I outlined a number of goals, including:

- NDSU will further raise the caliber of its research enterprise.
- NDSU will be among the top 15 computer centers in the world.
- NDSU will continue to be one of the leading agricultural research programs in the world.
- NDSU will make advancements in the arts, humanities, health sciences, material science and science, and engineering and mathematics educational programs.
- NDSU will become one of the top 100 universities in the number of National Merit Scholars enrolled.

NDSU is an institution that continues to advance and succeed. Our stature is growing, our programs are being recognized across the nation and the best is yet to come.

**- Joseph A. Chapman**

## DEAN'S MESSAGE

We are working on a new strategic plan for the college, including the development of new mission, values and vision statements. Although we have just initiated this process, it is already clear to me that our leadership team highly values service and that service to the community in particular will be part of our strategic planning.

Our faculty members are already involved in such service, of course. Many of us, for example, followed Don Schwert's flood page this spring (www.ndsu.nodak.edu/fargoflood). And we began a new service of monthly events this year to take science to the community: the Science Cafés (described in this issue).

What you will not see here are multiple pictures of our wonderful students, staff and faculty members who committed to community service in preparing for (and, for the most part) surviving the flood. But I had to include at least one: I promise you that at least some of the hard-working volunteers in the picture to the right are proudly representing our college and North Dakota State University.

Please let us know any ways in which we can serve you!

**- Kevin D. McCaul**

Faculty, staff and students of NDSU joined the larger community at the Fargodome to fill sandbags during the spring flood.



## COLLEGE NEWS

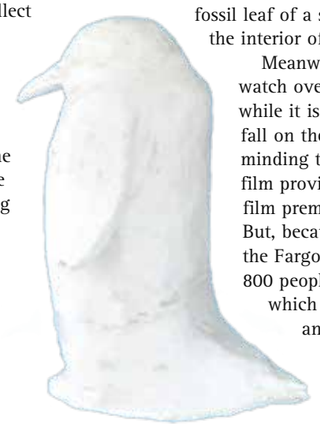

Adam Lewis, Anne Aghion and Allan Ashworth were on hand at the Fargo premiere of the documentary film that covered the faculty members' research in Antarctica.

# "Ice People" shines at Fargo Theatre premiere

Well-wrapped audience members stepped gingerly on slippery paths among Emperor penguins sculpted from snow to attend the premiere of "Ice People" at the Fargo Theatre in early March. The life-sized penguins were a special treat for the premiere, created by three landscape architecture students who do competitive snow sculpting. "Ice People" seeks to capture the experience of living and working in Antarctica's extreme environment. The film focuses on staff and students from NDSU's geosciences department, as they camp in the mountains during an Antarctic summer and collect samples from ancient glacial deposits in their search for fossils.

"Ice People" was produced and directed by Anne Aghion who, along with a cinematographer and sound technician, spent four months filming in Antarctica to capture the experience of living and working in an extreme environment. Much of their time involved living with and filming the NDSU geology team.

In their studies, distinguished professor Allan Ashworth focuses on the fossils and assistant professor Adam Lewis focuses on tills. Till is made of clay, sand, gravel and boulders laid down by glaciers. When the glaciers retreated, lakes and rivers deposited sediments that contain fossils of the plants and insects that colonized the landscapes. Together the soils and fossils are a rich source of information about the Earth's history and global climate change. In their discoveries, Lewis and Ashworth are rewriting part of Antarctica's history. Among other things, they have opened up our understanding of a major climate change at 14 million years ago. For example, the leaf fossil we see uncovered in the film was only the second time a fossil leaf of a southern beech tree has been found in the interior of Antarctica.



Meanwhile, at home, the wives of the scientists keep watch over the mundane. The seasons are reversed so while it is summer in Antarctica, the chores of winter fall on their shoulders, along with paying the bills and minding the family. Hazel Ashworth is retired and the film provided some unique rewards for her: attending film premieres in San Francisco, Paris and New York. But, because of friends, family and students, she said the Fargo premiere was the most fun of all. More than 800 people attended the Fargo showing, an audience which she described as being "as sophisticated as any of them."

*continued on page 4*

Allan Ashworth, junior Spencer Salmon, alumna Jane Willenbring and Adam Lewis show their Bison pride during the 2008 trip to Antarctica.

Colleen Lewis is a speech language pathologist with West Fargo Public Schools and has two young children. Having her husband away is hard because they don't live near their extended family and because he misses so many moments in the lives of their children, frustration he also expressed and hopes to remedy by staying home this year. She is happy that he loves his work and said she was really pleased with the film because of the insight it provided into her husband's work. "I was glad to see that because I don't really know what he does there," she said. "It's nice to get that visual and see how they are excited about the research they are doing. I think he does have a good time there."

When Aghion approached him about filming the NDSU team, Lewis was reluctant: "I told her you can't screw it up. You can't mess with us. You have to camp parallel to us. You do your thing and we'll do our thing."

Ashworth, the principal investigator on the project, also had to be convinced that having a film crew along was a good thing. It took Aghion's direct assurances for Ashworth to feel comfortable with the arrangements.

Lewis does most of the logistical planning for the trips and said he didn't want to be responsible for a potentially flaky film crew who might not understand the hazards of Antarctic camping. The two teams camped a few feet apart and Lewis quickly discovered his prejudices were unfounded.

Past experiences with filmmakers were stressful and distracting, with camera operators staging shots and interviewers asking loads of questions but never really understanding because they didn't stick around to experience the process and lifestyle of deep research. The Aghion team was unobtrusive, but always there. "Anne was absolutely 100 percent organic," Lewis said. "She would just sit and talk with us. They just became these other field party members." Her ethnographic approach shows and has garnered overwhelmingly positive reviews for the film.

Lewis has made 10 research trips to the Dry Valleys starting as a student. Ashworth has completed five expeditions, some working in the Dry Valleys with Lewis but also researching in more remote locations closer to the South Pole. Two of Ashworth's NDSU undergraduate students, Andrew Podoll and Kelly Gorz, were involved in the movie. During the past field season, Spencer Salmon, a junior majoring in geology, assisted the expedition. A person who loves snow, Salmon was surprised that the mountains of the area called the Dry Valleys, which is the site of much of the documentary, really are dry and full of the "true silence" of a place where nothing is living. Only the wind and the tools and machines of the human inhabitants provide sound and color. The yellow cone of the professor's double-walled tent and the blue, red and yellow of the research assistants' slug-shaped canvas shelter are bright spots in a brown and gray landscape.

> "Anne [Aghion] was absolutely 100 percent organic. She would just sit and talk with us. They just became these other field party members."
>
> *– Adam Lewis*

During the 2008 field season Jane Willenbring who graduated from the NDSU geology program in 1999 joined Ashworth, Lewis and Salmon. She is a postdoctoral researcher at the German Research Center for Geosciences, Potsdam, Germany. Earlier, she had worked in Antarctica with Adam Lewis when they were both students at Boston University.




**Left:** Allan and Hazel Ashworth. **Center:** Hazel Ashworth and Colleen Lewis. **Right:** Adam and Colleen Lewis.



# Gilbert presents "Stumbling On Happiness" as part of community lectureship series


Daniel Gilbert
*Photo by Marilynn Oliphant*

Daniel Gilbert, professor of psychology at Harvard University, presented "Stumbling on Happiness" May 3 at the Fargo Theatre, as part of the third annual NDSU College of Science and Mathematics Community Lectureship Series.

The presentation described the science behind why people seem to stumble "on" happiness rather than "upon" it. "Most people think they know what creates happiness and the only problem is getting it. But research in psychology and economics shows people routinely mis-predict how they will feel when they do and don't get what they are seeking, overestimating both the pleasures of success and the pains of failure," Gilbert wrote in his abstract.

Gilbert has won numerous awards for his research and teaching. In 2008 he was elected to the American Academy of Arts and Sciences. His 2007 book, "Stumbling on Happiness," was on the New York Times bestseller list 25 weeks, translated into 30 languages and awarded the Royal Society's General Prize for best science book of the year.

He is a contributor to Time, The New York Times and NPR's "All Things Considered" and has been a guest on TV and radio shows including "The Today Show," "Charlie Rose," "20/20" and "The Colbert Report." He will host the PBS NOVA series "Human Nature" in 2010.

# Science Café brings science to F-M community

Would you like a little science with your coffee? In a manner of speaking, that's the idea behind NDSU's new Science Café program, sponsored by the College of Science and Mathematics.

Encouraged on campus by Kevin McCaul, dean of science and mathematics, a Science Café is an academic presentation about a topic of public interest made in an informal, comfortable setting.

NDSU's first Science Café, "North Dakotans Matter More than Californians: Your Power and the Electoral College," was timed in conjunction with the fall general election, and was held at Fargo's Hotel Donaldson. The second, "What Motivates Suicide Bombers? The Psychology of Terrorism," was hosted by Babb's Coffeehouse in downtown Fargo. Other recent topics were "How Glass Changed the World," and the mathematics of Rubik's Cube.

"To me, a Science Café is like bringing science into someone's living room. Getting science out to the community as often as we can is part of my thinking," McCaul explained.

Science Café is a concept that is gaining momentum at campuses across the country, and there's even a national organization (see sciencecafe.org). While several universities hold their versions of a Science Café at museums, McCaul wants NDSU to focus on bringing science-related topics to locations where the participants can relax, enjoy the presentation and ask questions.

Benton Duncan, assistant professor of mathematics, who gave NDSU's first Science Café talk, shares that vision. "One of the most important jobs scientists have is to invite others to see the beauty in their subject. Too often, people think of scientists sitting in their lab doing abstract stuff that nobody else understands. I think it's important to break down that stereotype," he said. "The Science Café can serve as an opportunity to present the excitement of science, as well as connecting research with everyday life."

Duncan particularly enjoyed the discussion triggered by his talk, which he sees as a vital element to a Science Café. "I hope, in the long run, we are able to get people involved and excited," he said. "I hope we develop a culture of interaction that encourages everyone to be a participant in the work of the sciences."




The Science Café was developed through a committee comprised of McCaul; Duncan; Gregory Cook, professor of chemistry and molecular biology; Erika Offerdahl, assistant professor of chemistry and molecular biology; and Keri Drinka, director of college advancement.

Offerdahl was previously involved with a successful Science Café program when she was at the University of Arizona. "One of my goals is to create an atmosphere where community members feel welcome to interrupt, question, challenge and discuss important science-related issues with experts and other members of the community," she said.

NDSU's talks have attracted audiences of 25 to 35 people, and McCaul sees that as a sign that the project can develop into an important, and lasting, connection with the public.

"Although the College of Science and Mathematics is sponsoring this first year, ultimately I hope to bring scientists from across the university into it. NDSU has many scientists, social scientists, applied scientists in agriculture—we have much to offer," McCaul said. "We'd like to some day be a monthly series that is part of the fabric of our community. We hope people will say, 'Did you hear about last month's Science Café?' "

# Think spring – but not too early

## Study reveals ecological consequences of warming up too soon

Steve Travers

Ahhh spring – snow melting, birds chirping, trees budding – for most people the sights and sounds of spring can't come soon enough.

That's not the case for Steve Travers, assistant professor of biological sciences. Along with researchers across the globe, Travers is working hard to reveal the costly ecological effects of rising temperatures. He's spreading the message – careful what you wish for.

"We're not only seeing things get warmer," Travers said, "but plants and animals are changing what they are doing in response to it."

To demonstrate this, Travers and his graduate assistant, Kelsey Dunnell, analyzed the relationship between climate variables and the flowering time of native plant species in the Northern Great Plains over the past century.

They started with two primary questions: 1) Is Fargo warming up? and 2) Are plants changing when they flower?

Travers and Dunnell used climate data collected in Fargo as part of the North Dakota Agricultural Weather Network (a collection of 67 networked weather stations across the state).

Historic flowering data wasn't as immediately available.

When Travers joined NDSU in 2007 he had heard that former professor O.A. Stevens had recorded flowering dates for several plant species in the area. Armed with this information, Travers went digging in the library archives and struck gold. He found 51 years of handwritten notes from 1910 to 1961. They detail the precise flowering dates of more than 700 plant species in the Northern Great Plains.

Travers and Dunnell were able to compare the first flowering dates of native plant species in spring 2007 and 2008 to the flowering dates of the same species in the years 1911 to 1961.

They then compared the flowering data to climate variables, such as median daily temperature, snow fall and last freeze during each year.

Four main conclusions surfaced:

- Spring temperatures in the Northern Great Plains have gradually increased during the past 100 years.
- The flowering phenology of many plants native to the region is closely tied to climate, particularly temperature.
- Many local species are flowering earlier than they ever did in the past century.
- Further shifts in climate toward earlier springs in the Fargo area are predicted to result in significant changes in local flowering phenology and could have important ecological impacts.

Student Kelsey Dunnell stands next to passive warming cone for experiments on warming effects.

Travers and Dunnell have hypothesized about several negative ecological impacts. Pollinators might not shift causing reproductive issues; plants may flower and then be destroyed by a freeze; and crop diseases, which traditionally couldn't make it through short growing seasons, may spread.

But to Travers, this study is all wrapped into a bigger question – will the time shifts of some events disrupt others in the ecological world? The snowballing effect to the environment could be dramatic, requiring everything from reproduction cycles to migration patterns to adjust. For plants and animals that can't adapt, extinction is imminent.

Travers plans to continue gathering flowering data and hopes to get more people involved.

"One of things we are trying to do is to get amateur botanists or anyone who likes to go and just look at things outside, keep their eyes open and let us know through our Web site (www.ndsu.edu/ndsu/phenology) when things are flowering. The more people who are looking at it the better data we get."

Despite the negative trends he is uncovering, Travers stays optimistic. "There are certainly a lot of aspects about it that can make you get really depressed. But there are also glimmers of hope that things can change," Travers said. "There's a value to showing people the real data."

**Left**: A photograph of a cemetery in Lowell, Mass., taken on May 30, 1868. **Right**: a photograph of the same location on May 30, 2005, taken by Dr. Primack. The year 1868 was not the coldest for New England, but the tree branches were still bare at the end of May. In 2005, the leaves were out and the flowers in bloom. Compared with Thoreau's observations in the mid-19th century, blueberry bushes in Concord, Mass., are now blooming more than a week earlier.

# STEM Education doctoral program launched

In January, the Science, Technology, Engineering and Mathematics (STEM) Education doctoral program was launched through the School of Graduate and Interdisciplinary Studies. This interdisciplinary program is one of the first discipline-based educational research programs in the United States.

"There has been a significant amount of interest for this sort of degree program," said Erika Offerdahl, one of three faculty hired for the STEM education program. "There are very few programs that train people to do educational research in their discipline. That is why NDSU is so special. It is really visionary."

The purpose of the program is to prepare future college faculty who can successfully teach in their discipline and conduct research focused on teaching and learning at the collegiate level. Mila Kryjevskaia, another faculty member hired for the STEM education doctoral program, says that nationally there is a higher demand for faculty who will conduct educational research. "These faculty tend to work in isolation within their department, but here at NDSU there is a collaborative interdisciplinary team dedicated to student learning and discipline-based research in education," she said.

Possible research projects of students in the STEM education doctoral program might involve studying large-lecture learning environments, technological tools used for formative assessment, development of the understanding of the nature of science, gender issues in learning or characterizing barriers to knowledge integration in science and math.

The founding faculty members have joint appointments in the Colleges of Science and Mathematics (80 percent) and Human Development and Education (20 percent). The expectation is that future STEM education faculty also will be scientists with primary appointments in STEM departments.

The faculty and program work in collaboration with existing educational research programs in the STEM disciplines, the College Teaching Certificate Program and STEM educational research projects already established at NDSU.

> "There are very few programs that train people to do educational research in their discipline. That is why NDSU is so special. It is really visionary."
>
> *– Erika Offerdahl*

Interdisciplinary faculty established three required courses to coincide with students' diverse educational backgrounds. They ensure a strong understanding in education, research and expertise within a student's discipline. Discipline-based courses will complement the students' research interests as they conduct research for their dissertation to complete the program.

Organizers are in the process of hiring one more faculty member for the STEM Education doctoral program. The first student began in Spring 2009 with several more beginning in Fall 2009.

# Biological sciences professor author of most-cited article

Craig Stockwell

Charles Darwin, commonly known as the father of evolutionary biology, said evolution would only be observed over long periods of time. He also acknowledged that evolution could occur due to artificial selection. According to Craig Stockwell, associate professor of biological sciences, this means that Darwin recognized that evolution could happen rapidly. "What Darwin probably didn't anticipate was the degree to which humans could become novel and important selective agents for wild populations," he said.

Stockwell, an evolutionary conservation biologist, has studied the response of wild fish populations to novel selection pressures. He applies scientific principles of evolutionary biology and ecology to his research subject to discover how evolution contributes to species persistence and endangerment. In February 2003, Stockwell was lead author on a journal article, titled "Contemporary Evolution Meets Conservation Biology," that was published in Trends in Ecology and Evolution. In June 2008,

*continued on page 8*

Thomson Reuters Essential Science Indicators, a journal and clearinghouse that provides summaries of information, identified the article as the most-cited paper in its field of research. Managers of Sciencewatch.com also selected the paper as a Fast Moving Front article in the field of plant and animal sciences.

In the paper, the authors reviewed literature and tried to draw on major areas of rapid evolution. "For example, insects evolve resistance to pesticides. In the medical field, viruses evolve in response to vaccines," Stockwell said. "Our areas of interest focus on factors that can promote evolution, such as the introduction of non-native species or the harvest of game and fish species. For instance, harvested fisheries, have been shown to evolve toward smaller fish."

Stockwell and colleagues also looked at exotic species including mosquito fish, rainbow trout and zebra muscles, and discovered that besides habitat change and overharvest, exotic species are major factors that drive evolution as well as extinction. He says that exotic species often eliminate native species by preying on them and competing with them.

A relatively young discipline, conservation biology has been around only about 30 years. In the 70s and 80s there were few documented cases of rapid evolution. Since then, case studies have dramatically increased. In fact, Stockwell and his colleagues have documented three case studies during the past 15 years.

Stockwell, who joined NDSU in 1998, wrote the article with Andrew Hendry from McGill University and Mike Kinnison from the University of Maine. The men all had documented separate case studies of contemporary evolution and were familiar with each other's work.

"Our work is taking the large number of new studies in basic literature and asking: What does it mean in the applied sense?" Stockwell said. "I think that is where the field is starting to move—in applying evolutionary principles in the management of wild populations."

He currently is working with a collaborator in New Zealand to examine the role of evolution in the establishment and invasion of an exotic species. He also is considering the role of evolution in the new field of restoration ecology.

Stockwell enjoys the outstanding opportunities for continual learning and conducting global research. "Professors are continually pressing their own boundaries and trying to explore new areas within their disciplines," he said. "You are paid to be curious, to ask questions and to learn."

# Forensic DNA Facility open for business

Forensic DNA analysts use science to help determine guilt or innocence in crimes.

Criminal investigators across the country have a new ally in fighting crime. The NDSU Forensic DNA Facility officially opened in September 2008 after receiving accreditation from the International Standards Organization. Accreditation was the final step in the two-year process of creating the facility, which is already taking on cases to assist the criminal justice system with investigations that can determine the guilt or innocence of the accused, civil litigations and familial analyses.

Berch Henry, program and laboratory director, and Thomas Wahl, senior forensic DNA analyst, came to NDSU in July 2006 to create the facility using a $3.5 million grant from the National Institute of Justice. Henry and Wahl are long-time veterans of forensic DNA analysis and have helped build several labs for law enforcement, universities and private entities over the years to examine DNA—deoxyribonucleic acid—the miniscule molecule in cells that contains genetic information unique to each individual life form. Opening a forensic DNA facility in two years is an accomplishment, Henry said. Labs can take three to five years to get up and running. He credits a large part of that speed to the university.

"If this had been other places I've worked, it probably would have taken an extra six months to a year," Henry says.

The facility is the first in the country to combine teaching with a functioning forensic DNA lab. The showpiece of the lab is a Zeiss P.A.L.M. MicroBeam Laser Catapult Microscope, which makes possible research and casework analysis that other labs can't perform. Such equipment costs too much for government labs that wouldn't use it enough to justify the $250,000 price tag. This specialized microscope allows analysts to capture cells from mixed samples containing cells from two or more donors. Because DNA testing may destroy samples, the Zeiss LCM can provide the edge needed in cases where little evidence is left. Only a handful of labs in the country have this technology.

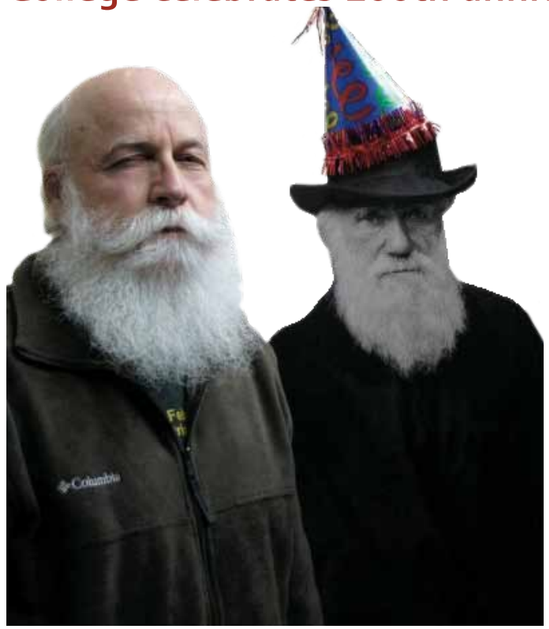
Besides taking on cases for criminal and civil investigations, Henry and Wahl study new ways to maximize results from the smallest amount of DNA. Government forensic labs are able to send scientists and technicians to NDSU for training. Stuart Haring, assistant professor in the Department of Chemistry and Molecular Biology who specializes in DNA metabolism and cell cycle regulation, was hired to teach biochemistry doctoral students who want to add an emphasis in forensic DNA—the first such program in the nation.

The facility serves as another piece of Sen. Byron Dorgan's vision for a biotechnology corridor between Fargo and Grand Forks. Over time, the lab can pull in research grants, train a pool of employees for high-tech and biotechnology industries and raise NDSU's profile.

Under the terms of the grant, the facility must be self-sustaining in three years and will do so through a mix of casework, consulting revenue and new grants.

The facility's Web site is www.ndsu.edu/dna. For more on the Forensic DNA Facility and the people who work there, see the fall 2008 issue of NDSU Magazine.

# College celebrates 200th anniversary of Darwin's birth



William Bleier was one of the professors on hand for the celebration of Charles Darwin's 200th birthday.

The Department of Biological Sciences, College of Science and Mathematics, and the Biological Sciences Graduate Student Organization at North Dakota State University hosted an event on campus in celebration of the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the 1859 publication of Darwin's "The Origin of Species."

"Darwin Day promotes understanding of evolution and the scientific method," said Larry Jones, president of the Institute for Humanist Studies, which administers The Darwin Day Celebration. "This celebration expresses gratitude for the enormous benefit that scientific knowledge has contributed to the advancement of humanity."

The event was held in the Century Theater in the NDSU Memorial Union and included a panel discussion with experts on evolution, philosophy, and science and religion. The panel consisted of members from departments across NDSU, including biological sciences, geosciences, entomology, mathematics, and philosophy. Attendees included faculty, students and community members and numbered near 130 people. The celebration continued following the panel discussion with the showing of the PBS Evolution Series, documenting Darwin's life and journeys. This was followed by a true birthday celebration, complete with cake, punch and balloons.

The Coalition on the Public Understanding of Science (COPUS) has designated the year 2009 as the Year of Science. Within the Year of Science celebration, February was designated for celebrating evolution across the nation and by scientists around the world. This grassroots effort focuses on celebrating science and understanding. Hundreds of groups across the United States and the globe celebrated "Darwin Day" in honor of the discoveries and life of the man who famously described biological evolution via natural selection. Evolutionary theory overarches and underlies the modern, scientific understanding of all biology, from ancient fossils, to microscopic bacteria, to human disease, all the way to rain forest ecology. Perhaps no other ideas have impacted our views of the living world so profoundly as the core evolutionary concepts of common ancestry and natural selection.

The Darwin Day Celebration started with one event in 1995. Last year there were more than 850 Darwin Day events world-wide. Darwin Day festivities include debates, lectures, essay contests, film festivals, museum exhibits, art shows and even an "Evolution Banquet" with "Primordial Soup" followed by a "Darwin Fish Fry." We look forward to expanding our Darwin Day celebration next year to include more outreach opportunities.

**- Peggy R. Biga,**
**assistant professor**
**of biological sciences**

Panelists discussed evolution and scientific method.


Hundreds of groups around the world celebrated Darwin Day.

# Class notes

## 40s

**I.J. Wilk, BS '42, chemistry**, was named senior scientist for Neohydro Technologies Corp. in Houston. A world-renowned chemist in the field of electrolysis, he will assemble and manage the company's chemical and microbiology team. He oversees the company's research and development in all waste-water treatment applications, leads the company in obtaining approvals for sterilizing medical devices for the medical industry and directs the company's "green initiative" using electrolysis to eliminate the spread of salmonella and E coli for the food industry.

## 60s

**Dr. Allen Van Beek, BS '64, bacteriology**, received the University of North Dakota Alumni Association's Sioux Award recognizing his medical career. Van Beek, who earned a bachelor's degree in medicine from UND in 1966, is most noted for reattaching the arms of John Thompson, a teenager injured in a farm accident in 1992. Van Beek is a clinical adjunct professor at the University of Minnesota.

**Roger Worner, BA '66, science and mathematics**, retired in June as the superintendent of Centennial Schools in Circle Pines, Minn. He has spent 44 years as an educator, and plans to continue his adjunct teaching position at St. Cloud State University.

## 70s

**Louis Ogaard, PhD '79, botany**, recently returned from two years in Bolivia to head an alternative fuels research and development project for the Center of Excellence for Hazardous Materials Management, a non-profit organization funded by the Department of Energy and the state of New Mexico. He has a staff of scientists and engineers working to convert algae into biodiesel. He lives in Carlsbad, N.M.

## 80s

**Mark Ehrmantraut, BS '89, psychology**, became pastor at North Highland United Methodist Church in Aberdeen, S.D. He worked in special education for 15 years prior to entering the ministry.

## 90s

**T.J. Schmitt, BA '95, zoology**, joined the teaching faculty at Barnesville, Minn., high school. He is teaching biology and life science.

**Roxana Uttermark, BS '97, psychology**, was named South Dakota School Psychologist of the Year by the South Dakota Association of School Psychologists at their annual conference in September. She has worked for the North Central Special Education Cooperative in Aberdeen, S.D., for the past nine years and has been a school psychologist since 1999. Originally from Bucharest, Romania, she considers Fargo her hometown.

**Jeremy Zwinger, BS '97, biological sciences**, chaired the 2008 World Rice Commerce Conference in Chiang Mai, Thailand, in October. He is the first American to chair the conference, which attracted brokers and growers from more than 30 countries. His brokerage company, Farm and Trade Inc., is located in Colusa, Calif.

**Ben Hinsperger, BS '98, microbiology**, was recently promoted to major and assigned to Buckley Air Force Base in Denver. His job is a flying staff position for an Air Force intelligence program. A senior flight instructor and evaluator with more than 3,000 flight hours, he saw combat time during both Operation Iraqi Freedom and Enduring Freedom.

## 00s

**Dr. Brian Gatheridge, BS '01, MS '04, psychology**, is a clinical psychologist at MeritCare Clinic in Detroit Lakes, Minn. He and his wife, **Melisa (Satterlund) BS '03, psychology**, and their daughter, Tatum, live in Detroit Lakes.

**Dr. Nicholas Bakkum, BS '03, biological sciences**, joined Cornerstone Dental Group in Fargo. He is a graduate of the University of Minnesota School of Dentistry in Minneapolis.

**John Goering, BS '03, MS '08**, chemistry, teaches physical science, chemistry and physics at the Barnesville, Minn., high school.

**Jennifer Jerome, BS '03, psychology**, joined Northland Counseling Center in Grand Rapids, Minn. For four years, she has been working in the human service field providing after care with youth and their families and in-home family services.

**Eric Ruhland, BS '03, zoology**, joined the Hastings, Minn., Veterinary Clinic. The practice covers the treatment and care of a wide range of animals.

**Caleb Getz, BS '04, biological sciences**, joined Litchfield, Minn., High School as a chemistry and physical science teacher.

**Lynelle Anderson, BS '06, psychology**, was promoted to business banking assistant at Western State Bank of West Fargo. She has been with the bank since 2007 as a customer service representative and consumer loan assistant.

**Danielle Fraser, BS '06, zoology**, joined the Pfeffer Chiropractic Clinic, Osakis, Minn. She specializes in exercise and nutritional coaching.

**Jess Wiemann, BS '06, zoology**, joined AgCountry Farm Credit Services as an associate business analyst serving customers in the Fargo area. She previously was a property manager with Goldmark Property Management, Fargo.

**Scott Ayash, BS '07, physics**, joined the University of North Dakota Energy and Environmental Research Center as a research scientist.

**Katy Gilderhus, BS '07, psychology**, was promoted to lead teller at the Choice Financial branch in south Fargo.

# Obituaries

**Lowell F. Wood, 94, MS '37, polymers and coatings,** a long-time supporter of the Department of Coatings and Polymeric Materials, died June 8, 2008. The former vice president of Frost Paint & Oil Corporation, Wood held many offices in the Northwestern Society over the years.

His relationship with NDSU began when he and his wife, Irene, came to Fargo from Pennsylvania so he could earn his master's degree. Five minutes after his last exam in 1937, Western Paint and Varnish Co. of Duluth, Minn., hired him. He left the company for Frost Paint in 1942 and stayed there until retiring in 1989 at the age of 75.

Wood established the Lowell Wood Polymers and Coatings Graduate Scholarship Fund at NDSU to help aspiring chemists with their education costs. Thousands of dollars were donated by this foundation directly by Wood and were supported by the Northwestern Society. He established this fund with $100,000 in 1994. In 2008, he gave the bulk of his estate to NDSU, which when finished will provide the university more than $1.1 million in funding.

Wood was a member of the American Chemical Society, the Federation of Societies for Coatings Technology, and the Polymers & Coatings Industrial Advisory Committee for NDSU.

Wood was a railroad enthusiast and antique engine collector. He also enjoyed traveling overseas.

He was preceded in death by wives, Irene and Dorothy, and a daughter. He is survived by a brother, a son, two stepdaughters, two granddaughters and five great-grandchildren.

**Share your news with other college alumni by sending an e-mail to keri.drinka@ndsu.edu**

# what have you been up to?

Here's what to include: Your full name, the year you graduated, your degree(s), your current e-mail address, work telephone number, the city/state/nation where you now reside, your current employer and position, plus any news you'd like to share, including promotions, honors, awards, major projects, volunteer activities, important family news, etc.

Updates will be in next year's "class notes" section. And, if you've been doing something really big, exciting or unusual, we might contact you about appearing in a feature article.



# A letter from the College of Science and Mathematics Ambassadors

The College of Science and Mathematics student ambassadors are: front row left to right Kate Kirby, Alexis Krier, Kit Wong, Rebecca Iwanicki and Breanna Siegler; back row left to right, Isaac Kelsey, Andrew Nyhus, Mark Spanier, Jarrett Failing, Shane Ewert, Drew Gehring, Jordan Boe, Nicholas Galt

I would like to say a big hello to everyone from the College of Science and Mathematics Ambassadors and want to talk a little bit about all of the happenings in our organization this past year.

The year started on a good note with a large number of new members. Thanks to all the faculty and staff who helped in nominating these great new members.

As an organization, we meet on a bi-monthly basis with Dean Kevin McCaul and our adviser, Keri Drinka. In addition to our bi-monthly meetings, we are kept busy by activities such as helping out at Discover NDSU day, volunteering at the Dorothy Day Food Pantry, helping set up for talks given in the community, working at graduation, and judging for science fairs and Science Olympiad.

Last year the ambassadors awarded the first College of Science and Mathematics Award of Excellence to Gary Clambey, associate professor of biological sciences. This award goes to a faculty or staff member chosen by our members.

As we go into the future, our organization plans to continue serving the College of Science and Mathematics in various forms and providing a student's voice in the college.

**– Mark Spanier, president**

# Beekman earns Undergraduate Research Fellowship

Conducting research at a university is often a perk of age and experience, but educators have come to understand that early exposure to hands-on research both inspires students to aim high and improves their academic performance. Such is the case for Leah Beekman, a freshman nursing and psychology major from Eagan, Minn. Beekman is one of the first students to be awarded an Undergraduate Research Fellowship in the Department of Psychology.

Beekman was picked for the award while still in high school based on her academic record and her expressed interest in psychology. Having watched friends struggle with anorexia, she is deeply interested in eating disorders education and was considering a career as a clinical psychologist or a forensic psychologist.

Like other students in the program, Beekman picked the research she was interested in and set up interviews with faculty in order to fit the fellowship to her interests and schedule. She picked associate professor Michael Robinson and his mindfulness studies because of the wide variety of his projects. She liked that he had a distinct point of view as well as the flexibility to let her focus on school work. She spent about four hours a week in the laboratory where she ran participants through studies, attended lab meetings, and met with the project team to help design experiments. "It really opened my eyes to what the research really is and how much work goes into it," Beekman said. "I'd definitely like to continue. You get a process going and get these ideas flowing and it's kind of hard to give up." While she now plans to become a pediatric oncology nurse instead of a psychologist, she said her study of psychology and her fellowship experience will play an important role in her future choices.

Leah Beekman spent time running participants through psychology studies to help further research in the field.

Paul Rokke, chair of the psychology department, said though students may ultimately choose another major, time spent learning research methods and participating in projects will never be wasted. The purpose of the research fellowship is to get freshmen excited about psychology and encourage bright students to attend NDSU.

The College of Science and Mathematics offers many research opportunities to undergraduates, but giving that experience to incoming freshmen is uncommon. A generous donor funded the program, and high school seniors with an interest in psychology can apply for the fellowship for 2009–2010.

**Konrad Bresin**
Senior psychology major

### On NDSU:

Bresin works in the research labs of both assistant professor Clayton Hilmert and associate professor Michael Robinson. He helps run research volunteers through tests, fine tune programs and design studies. He was listed as third author of one of Robinson's papers in the past year.

### On related work:

Bresin also works in a local residential facility for young people with behavior problems. "We take the worst of the worst—kids that don't work in other places. It's more interesting to see someone interact in an environment. I like to keep ties with real people because you can get more ideas."

### On psychology:

"I just think I'm interested in people. Everybody's so different, but there's so much of the same from biology."

### On the future:

Bresin has applied to many doctoral programs and is waiting to hear from them.

# Three-across is 'success' for senior Andrew Sand

Andrew Sand

Andrew Sand finds pleasure (and some cash) in seven-letter words starting with "S." The NDSU senior, who is majoring in chemistry and mathematics, loves crossword puzzles.

"I've always enjoyed them; I do two or three every day," said Sand, who starts his mornings with the New York Times puzzle. "Last year, I decided to write some just to see if I could do it."

A native of Jamestown, N.D., he discovered a knack for the brainteasers, and creating 15 x 15 square puzzles became a part-time job. Sand produces two puzzles each week for The Spectrum, the NDSU student newspaper. He's also sent several to magazines, which have come back for revisions.

"First, I need a theme. The long answers, the 15-letter ones, can be clever, words that sound the same or anagrams," Sand explained. "I build a grid around that."

His most fun comes in those pesky clues, the ones that purposely mislead and confuse the person with the pencil. "Clues are the best part. You want people to solve it, but you want them to have a challenge to get there. Our goals are the same—solve the puzzle," Sand said, noting it takes three to four hours to form a crossword.

Sand's personality may hold a key to his interest in crosswords. For him, competition or a race against the clock is to be savored. "I like tests when you have a limited amount of time," Sand said. "And I always do puzzles as fast as I can."

An outstanding student, Sand has reached senior status at the age of 19. Now in his second year at NDSU, he accumulated more than 80 credits taking Jamestown College courses while still in high school.

Sand conducts research in a group led by Uwe Burghaus, assistant professor of chemistry and molecular biology, and is the co-author of four papers. He also leads problem sessions three times per week for an organic chemistry class.

With a career goal to earn a doctorate in chemistry and teach at a university, Sand plans to pursue his sidelight. "I'll definitely try to get published in a major newspaper," he said. "I'd really enjoy that."

Sand is the son of Erik and the late Vicky Sand. His father, an assistant professor and chair of computer science at Jamestown College, earned his master's degree at NDSU.

# Student receives NASA fellowships for wireless sensor networks

Phillip Reindl

Graduate student Phillip Reindl doesn't let his NASA awards cloud his desire for an earth-bound career in computer science. Reindl received four NASA space grant fellowships, including two as an undergraduate student.

"It's great," said Reindl of the honors. "My dad is the only person I know who watches the NASA channel, so he is pretty proud of me. He likes to watch the shuttle launches and docking with the space station. My brother, Dennis, kids me that I'm now the favorite son."

Reindl's fellowships came in fall 2007, spring 2008, fall 2008 and spring 2009 semesters. They are based on his work on wireless sensor networks with Xiaojiang "James" Du, assistant professor of computer science.

The networks are a series of small computer nodes that communicate wirelessly with each other. The uses for such systems are varied and complex. For instance, NASA uses one to monitor ocean temperatures and currents. The agency has a long-range goal for sensor networks orbiting the Earth, moon or Mars to study topology or chemical composition.

Reindl's work primarily involves critical issues of power and security, as he studies data and lends a critical perspective to ongoing research in this area.

"There can be hundreds or thousands of nodes interacting as a unit, but each one is independent from the others. The nodes are often in inhospitable areas—NASA has a network monitoring a volcano—so it's difficult to change batteries," he explained. "On the other hand, you have security issues. If the network has a military use, you wouldn't want the enemy to intercept communications or take over a node. That provides an interesting challenge."

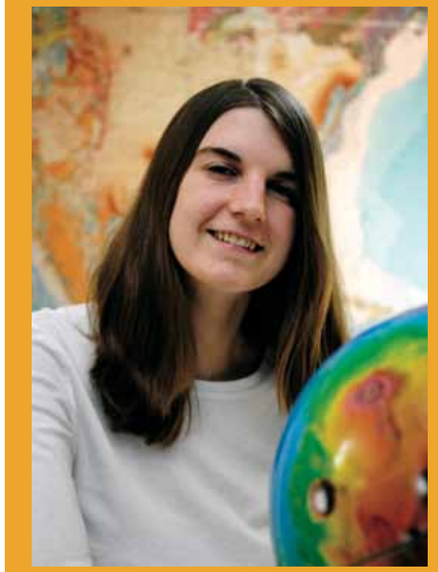
Reindl appears ready to meet that test.

"Mr. Reindl is an intelligent student. I was very impressed with his preparedness and willingness to take on new research activities," said Du. "He has clearly demonstrated academic potential."

Reindl, who grew up in Farmington, Minn., envisions a career with a technology-based company. His current research may eventually have applications in space, but he'd like to work in a much more grounded setting, perhaps with a local firm.

"I prefer making devices, rather than designing software. I like tangible things that I can point to and say, 'I made that,'" he said.

Reindl is the son of Nick Reindl of Brainerd, Minn., and Myna Lewis of Hot Springs, S.D. His wife, Katie, is an NDSU assistant professor of biological sciences.



## Marissa Detschel

### Graduate student in the Department of Physics

**On NDSU:**

Detschel conducts research with Ken Lepper, assistant professor of geosciences. They are researching how sunlight on the surface of Mars affects a measurement process that is used to determine how long sediments have been buried on the planet. The work was supported by a grant from NASA's Mars Fundamental Research Program.

**Publications and presentations:**

Detschel and Lepper's article "Optically Stimulated Luminescence Dating Properties of Martian Sediment Analogue Materials Exposed to a Simulated Martian Solar Spectral Environment" was published in the April 2009 issue of the Journal of Luminescence. Detschel presented the paper at the annual meeting of the American Physical Society in Pittsburgh on March 20.

**On research:**

"I have always had an interest in physics and geology and this cross-disciplinary project allowed me to be able to utilize both of these fields of science."

**On the future:**

Following graduation, Detschel plans to return to the work force. "I plan to obtain a position with the federal government that will utilize my scientific experiences."

# Lybeck finds passion for educational psychology

Alyssa Lybeck

When she started studying at North Dakota State University, Alyssa Lybeck sought a degree in business. She prides herself on her leadership skills and loves working with people, so she assumed that business would be a good fit. But then math happened.

After taking a psychology course Lybeck said, "I fell in love with how the brain works and why we do what we do." The 20-year-old junior now looks forward to a future career in educational psychology.

Lybeck grew up in Cando, N.D. Inspired by her mother, a fifth grade teacher, she has a vested interest in the educational system and learning patterns of students. Whether a child is gifted or struggling with a learning disability, Lybeck wants to make a difference by helping to meet the academic needs of all students.

Lybeck enrolled in more psychology classes and met Verlin Hinsz, an NDSU professor, who became her adviser. "It was great to get advice from him," she said. "After getting to know me and my future plans, he suggested classes that he thought would satisfy me and my interests."

Hinsz taught Lybeck to prepare for the future. When she decided to go to graduate school, he encouraged her to begin research in child development. "He helps you figure out how to make your future successful," she said.

Last summer, Lybeck got a glimpse of what life is like for an educational psychologist. While living in Jamestown, she worked as a preschool teacher at the YMCA. There were some three-year-old girls who were having difficulties learning their ABCs. Each day, Lybeck played an alphabet puzzle game with the girls and by summer's end they knew the alphabet.

"It really inspired me and helped me realize that I was meant to do this," she said. "I felt like I was making a difference and I am not even in my profession yet. Teaching those girls the alphabet helped them with their speech and it helped them relate to people."

Lybeck says her family is her biggest support system, specifically her mom. "My mom has taught for 33 years and she is my best friend. She has always pointed out my good qualities and encouraged me to do what I wanted to do," she said.

# The man behind the mask—Thundar reveals himself

With seven minutes remaining in the fourth quarter of the last home football game, Thundar, the NDSU mascot, stepped onto the field during a break. While game rituals usually include T-shirt slinging and stunt performing, this time it was different. In front of the packed Fargodome, for the first time in four years, Thundar walked onto the field without the Bison suit. Instead fans got to meet the person behind it—Geoffrey Childress, a graduate student in applied statistics. The reveal was because Childress was retiring. He had just turned in his final performance at home.

Childress didn't expect much fanfare, a couple claps at best. But what he got was a long-lasting standing ovation and some surprised faces. "It takes you out of your comfort zone to realize this wild and crazy person you see on the field wears a calculator on his watch," Childress said.

But he isn't bothered by stereotypes, instead he enjoys breaking them. "It does shatter some expectations," Childress said. "It does everyone a bit of a service to realize, everyone has talent…maybe something you wouldn't even expect."

Admittedly, Childress' personality is nothing like the alter-ego he created on the field. He is a soft-spoken, academic-type who enjoys the solitude of small-town North Dakota living. He'd rather silently observe from the back corner than make the news.

Thundar, however, is outgoing, confident and energetic.

Childress talks about Thundar in the third person, just like actors speak about roles. "He's not afraid to be the center of attention and act ridiculously for the sake of a practical joke."

Despite the disparity, becoming Thundar wasn't difficult for Childress.

He was the mascot for his high school in Rugby, N.D. He also was a cross country runner, which helped him endure six hours straight inside a bulky suit that could reach 100 degrees. "It requires a bit of agility … being able to bounce around and hop into the stands. But it's just as much about good nutrition as it is athleticism. You need to plan ahead and make sure you don't get dehydrated."

Childress' theatre experience also made him eager to create a persona for Thundar, which had never been firmly established before. He didn't want Thundar to do anything too ridiculous or cartoonish. Instead, Childress added nobility and professionalism to the character.

At first, respect was hard to come by. When he started as Thundar in fall 2004, NDSU was still in the beginning stages of transitioning into Division I athletics. Apprehension and skepticism were prevalent. To add fuel to the fire, a new Thundar suit looked more like a horse than a bison. People didn't react well to the mascot.

The suit was quickly replaced. Respect came gradually. By fall 2008 Thundar was recognized as one of the top Division I mascots in the nation by being selected to Capital One's All American team. After several weeks of online voting, Thundar finished second out of 12 mascot finalists.

But the national credit wasn't as important to Childress as the gratitude he received at home. "I think what I am most proud of was how many people appreciated and liked what I was doing," Childress said. "I didn't even realize how many people cared until that football game."

# Local student plans career in area oil industry


Dillon Dolezal

The way Dillon Dolezal figures it, he's getting the best of both worlds. He plans a career in a field that intrigues him, and he gets to work near his hometown.

Dolezal grew up on a ranch near Grassy Butte, N.D., and is now a sophomore at North Dakota State University. He hopes to work as a geologist in the North Dakota oil fields.

"I've always been fascinated with geology, and all around western North Dakota there is oil field work and drilling," he said of his career choice. "I'll get to stay close to home, and do something I love to do."

Dolezal transferred from Dickinson State University, attracted by NDSU's respected geosciences department. He follows in the footsteps of his brother, Justin, and father, Bob, who both attended NDSU.

It's a choice he's glad he made, noting that it's fun to be around faculty and fellow students who share his interest in geology. When asked about his studies, Dolezal quickly describes a field trip in April that he and other NDSU geology students took to several communities in southern Minnesota. Along the way, they explored land comprised of tiny, ancient shells from sea creatures called brachiopods.

"We found shells of brachiopods that are way older than the dinosaurs, they are about a half-billion years old. That's cool," he said. "We'd walk across a field, and you'd be picking them off your feet. That's what the soil was—it was made up of fossils. Very cool."

For now, Dolezal has his near-term career sights focused on the Bakken shale formation in western North Dakota and eastern Montana. The area is estimated to hold as much as 400 billion barrels of oil.

"I guess I'm a naturally curious person. I'm interested in how the earth works. It's interesting to me how things can be formed and changed over millions of years, and how there can be oil two miles underground," Dolezal said. "I'm sure the oil industry will be crazy for a few years yet in my home area, so I may as well take advantage of it."

Dolezal said the friendly people of western North Dakota also draw him back to his home area.

If the plan works out for him, Dolezal will be among the many NDSU graduates who remain in the state to begin their careers. According to the NDSU Career Center 2007 annual employment report, 69.1 percent of recent graduates who said North Dakota is their original home state reported accepting employment in the state.

> "We'd walk across a field, and you'd be picking [fossils] off your feet ... very cool."
>
> *– Dillon Dolezal*

"I'd like to go back home, and work with the oilrigs for a few years. Maybe I'll make a career out of it; it depends on how I like it," Dolezal said, noting that future opportunities could take him nearly anywhere in the world. "There's oil, minerals or gold all over. I'm intrigued by that, and I'm interested in traveling the world."

# Student interns at Oak Ridge National Laboratory


Mason Swanson

Mason Swanson is looking for big results from very small things.

The North Dakota State University senior interned during fall semester at the Center for Nanophase Materials Science at the Oak Ridge National Laboratory near Knoxville, Tenn. His assignment was to help researchers work in the microscopic world of nanoscale materials.

A physics major from Minot, N.D., Swanson worked on the next generation of computer memory devices, the new step of development after the familiar hard discs currently found in computers and smart phones. "They're looking for semi-conducting materials that have special magnetic properties," Swanson said. "The research is in the early stages."

With about 1,500 scientists and engineers and a total staff of 3,800 people, Oak Ridge National Laboratory is a sprawling research facility covering 58 square miles. Established in 1943 to work on the World War II Manhattan Project, the laboratory now develops new energy sources, technologies and materials. The cutting-edge work comes in a variety of areas: biological, chemical, computational, engineering and environmental. Managed for the U.S. Department of Energy by UT-Battelle LLC, the laboratory has an annual budget in excess of $1 billion.

"The lab is unlike a university in that research is its only focus," said Swanson.

Swanson is a self-starter who sought out internship opportunities on the Internet. This one, sponsored by the U.S. Department of Energy, proved successful. "Applicants come from all over the country, so I'm glad I got this internship," he said. "I found there are so many internships offered through the National Science Foundation, that if you apply you have a pretty good shot at getting one someplace."

Swanson maintains a 4.0 grade-point average in his studies in physics, an area of science he enjoys because of its "logical solutions to problems."

In addition to his outstanding academic record, Swanson also participated last year in the GraSUS (Graduate Student-University-School) project. NDSU undergraduate and graduate students are placed in schools throughout the Fargo-Moorhead area, where they work with science or mathematics teachers to develop projects that enhance the experiences of students. NDSU students gain communication expertise as they bring innovative ideas into the classroom.

"That was an eye-opening experience," said Swanson, who assisted math teacher Michelle Bertsch at Fargo North High School. "I got to see the classroom from a entirely different perspective. I never knew how much preparation goes into lesson plans and lectures."

Swanson's career plans include graduate school and pursuing a doctorate. Eventually, he'd like to work at a university.

> "Applicants come from all over the country, so I'm glad I got this internship."
>
> *– Mason Swanson*

"Take every opportunity that you can find. Don't shy away from them," he said.

He clearly follows his own advice.

## Jarrett Failing

Junior in biochemistry and molecular biology

### Hometown:

Hallock, Minn.

### On picking a major:

Failing's interest began in high school anatomy and physiology classes. "I found it very interesting to see how things work in our bodies' smallest levels. The complexity of the human body fascinated me and I wanted to study it more thoroughly."

### On research:

Failing works on projects with Glenn Dorsam, assistant professor of chemistry and molecular biology. Failing's individual project focuses on apoptosis, or the body's natural process to eliminate unneeded cells. He is trying to break cancer's immunity to apoptosis and restore balance of white blood cells in leukemia patients. In April, Failing attended the international Experimental Biology 2009 Conference in New Orleans. He presented his research at the American Society of Biochemistry and Molecular Biology Undergraduate Student Research Poster Competition and was awarded honorable mention based on the quality of his research and presentation.

### On what makes him good at what he does:

"I've been doing this for two years. It's hard to measure your progress unless you look back at what you've done and see your path. It's not like one day you wake up and you discover the cure for anything. You're just one step on the way to get there, one person out of a bunch of people all working together."

### On what he does for fun:

"I enjoy making movies. I've been doing that since I was in junior high. I started with simply playing around with the video camera and that evolved into writing scripts and making actual films."

### On the future:

Failing plans to attend medical school. However, he is undecided whether he will practice medicine or focus on research.

# Research award split by Burghaus and Du


Uwe Burghaus


Xiaojiang "James" Du

Uwe Burghaus, assistant professor of chemistry and molecular biology, and Xiaojiang "James" Du, assistant professor of computer science, are the College of Science and Mathematics 2009 Research Award Recipients.

Burghaus' research interests lie in the nature of interactions between molecules and surfaces and how the properties of those surfaces modulate the chemical reactivities of small molecules with which they interact. Since arriving at NDSU in 2002, he has built a cutting-edge surface-science laboratory for his research, which yielded more than 35 peer-reviewed journal publications. His work appears in high-impact journals, and he has been invited to speak at three international conferences in the past three years. He also uses his facilities to perform outreach activities, most notably with the Native American community in North Dakota.

"Dr. Burghaus has succeeded in developing a highly productive, vibrant and well-funded research program," wrote professors Kenton Rodgers and John Hershberger in a nomination letter. "His research productivity and contributions at the cutting edge of his field have brought him international recognition from the surface science research community."

Du's research is primarily focused on various aspects of wireless networks, security, computer networks, systems and computing. Since arriving at NDSU in 2004, he has been awarded more than $855,000 in extramural research grants, and written 67 publications and 60 proposals. He is an editor of four international journals and has been chair of the computer and network security symposium of the IEEE/ACM international conference for four years.

"Dr. James Du writes a paper or a proposal at a rate of about one every two weeks. And he has maintained that pace for over four years," read a nomination letter from the Department of Computer Science. "Several words spring to mind as ways to characterize that level of sustained production. They are words like 'prodigious' and 'enthusiastic' and 'extraordinary.'"

# Robinson earns mentoring award


Michael Robinson

Michael Robinson, associate professor of psychology, received the College of Science and Mathematics 2009 Mentoring Award.

Undergraduate to graduate students regularly receive credit from Robinson, both in published papers and in his vita, where he lists the awards his students have received before his own accomplishments.

His influence on the faculty has been equally profound. He publishes with many faculty members from different subdiciplines of psychology and spends time with younger faculty on grant applications and manuscripts.

"Dr. Michael Robinson has pushed me to a level that I never thought I was capable of achieving and continues to do so," wrote graduate student Adam Fetterman.

"He is the reason I was able to discover my true passion, social psychology," wrote Brian Meier, a former student who is now an assistant professor of psychology at Gettysburg College.

> "He is the reason I was able to discover my true passion..."
>
> – *Brian Meier*
> former student



# McCourt awarded Hogoboom Endowed Professorship


Mark McCourt

Mark McCourt, professor of Psychology, earned the Dale Hogoboom Endowed Professorship Award for 2009 – 11. The professorship carries with it a salary stipend of $5,000 for each of the next two years and $1,300, also for two years, for expenditures related to academic endeavors.

He was selected because of his excellent achievement in all three areas of teaching, research and service. President Joseph A. Chapman noted that receiving the professorship is an indication of the highest esteem in which the recipient is held by his colleagues and the institution.

# Gordon honored for teaching


Robert Gordon

Robert Gordon, assistant professor of psychology, received the College of Science and Mathematics 2009 Teaching Award.

Gordon most often teaches Psychology 351, Research Methods II, a required course on experimental design and statistical analysis. Teaching a required and numbers-heavy course like this can be difficult, but Gordon consistently gets high ratings from his students.

"He has developed a teaching style which sets the bar high, challenging students to think about and engage in the material, while at the same time providing them with the resources they need to succeed in the class and in their overall mastery of the material," wrote psychology graduate student Kari Visconti in a letter of support.

Gordon often helps students outside the classroom, and he serves on the department's curriculum committee.

"He has demonstrated concern for the quality and breadth of training that our students receive, that it represents the core and contemporary features of the discipline of psychology, and did much to help the rest of us keep the students' best interests in mind," wrote professor Paul Rokke, chair of the department, in a nomination letter.

# Sheridan earns Engberg Endowed Professorship


Mark Sheridan

Mark Sheridan, professor of biological sciences, is the recipient of the Jordan A. Engberg Endowed Professorship Award for 2009 – 11. The professorship carries with it a salary stipend of $5,000 for each of the next two years and $2,000 also for two years, for expenditures related to academic endeavors.

He was selected because of his excellent achievement in all three areas of teaching, research and service. President Joseph A. Chapman noted that receiving the professorship is an indication of the highest esteem in which the recipient is held by his colleagues and the institution.

# Du and Nygard receive grant to secure wireless sensor networks


Xiaojiang "James" Du


Kendall E. Nygard

Xiaojiang "James" Du, assistant professor, and Kendall E. Nygard, professor, both in the computer science department, have received a three-year $358,748 grant from the Army Research Office to secure military wireless sensor networks.

In the project, "Designing Robust and Secure Heterogeneous Sensor Networks," Du and Nygard will design effective and efficient secure protocols and algorithms for military sensor networks. A sensor network consists of a large number of tiny, smart sensor nodes that are deployed in a wide geographical area, and can provide unprecedented opportunities to sense, instrument, manage and control large environments.

In this project, Du and Nygard have adopted a new and more realistic network model to study security issues in sensor networks. The model is called a Heterogeneous Sensor Network that consists of different types of sensor nodes with varying capacities. Du also received a research infrastructure grant from the Army Research Office in May 2007. This grant has been used to set up a large sensor network testbed for performance evaluations for the project.

Wireless sensor networks have many applications in the military, such as battlefield surveillance, target tracking and security monitoring. Sensor networks are expected to have an increasing number of applications in the military, and will become a critical component of the future digital battlefield.

As part of the project, Du and Nygard will train highly skilled undergraduate and graduate students.

"Under this grant, within the context of wireless networks, we are developing and testing new and important security-oriented protocols for the management of encrypted messages, synchronizing the actions of distributed sensors, and multi-hop routing of information packets," Nygard said. "These topics provide the research basis for several doctoral dissertations and master's theses of computer science graduate students."

According to Du, the project will significantly enhance the research capabilities and infrastructures in security and networking areas at NDSU. "The success of this project will have great impacts on the military and national defense, and build strong ties between computer science researchers and the Army Research Office," he said.

# Jayaraman receives CAREER award


Sivaguru Jayaraman

Sivaguru Jayaraman, assistant professor of chemistry and molecular biology, received a Faculty Early Career Development award, (also known as the CAREER award) from the National Science Foundation. He will receive a five-year, $575,000 award to conduct research outlined in his proposal titled "Imprinting Molecular Chirality in Solution During Photo-Transformations."

The CAREER program recognizes and supports the early career-development activities of scholars who are likely to become academic leaders. Recipients are chosen on the basis of creative career development plans that integrate research and education within the context of their university's mission.

"This is a highly-prestigious award that recognizes a faculty member's work and potential to become a leading national researcher," said NDSU President Joseph A. Chapman. "Through this award, the National Science Foundation has recognized the quality research conducted at NDSU."

Jayaraman's research plan integrates scientific research, educational training and public outreach. The research program will help train graduate and undergraduate students, while involving high school students and their parents through Jayaraman's program called PICNICS (Parents' Involvement in Children, Nurturing Intellectual Curiosity in Science).

The program teaches parents and students about recent advancements in science and it encourages young students to consider science as a career path.

Jayaraman joined the faculty at NDSU in 2006. He completed a postdoctoral fellowship at Columbia University, New York, after earning a doctorate from Tulane University, New Orleans. He earned a master's degree in chemistry from the Indian Institute of Technology, Madras, India, and a bachelor's degree in chemistry from St. Joseph's College, Trichy, India.



# NDSU chemistry professor receives CAREER Award


Uwe Burghaus

Uwe Burghaus, assistant professor of chemistry and molecular biology, received a $426,000 CAREER Award from the National Science Foundation.

The award will support Burghaus' research to characterize the absorption dynamics of small molecules on copper and gold model nano array catalysts, which are pertinent for the petroleum industry and the cleaning of exhaust pollution. With molecular beam scattering, the research will clarify the catalytic activity and particle size, as well as support effects, in the carbon monoxide oxidation reaction mechanism.

According to Burghaus, this reaction is one of the most important prototypes of bimolecular surface reactions. "The knowledge gained will promote catalyst improvements," he said. He also recently received a Department of Energy grant for studying desulfurization catalysts.

Burghaus is active in many diverse programs. He has been active in the Nurturing American Tribal Undergraduate Research and Education (NATURE) program since 2005.

He also has created hands-on activities for the Sunday Academy, an American Indian teaching project organized by Chad Ulven, assistant professor of civil engineering.

"The activities are fun and concern modern concepts for an alternative energy production," Burghaus said. In addition, nanoscience-related experiments are conducted as part of a regular physical chemistry laboratory class, which is a joint effort with Darin Ulness (associate professor of chemistry) at Concordia College.

In 2007, Burghaus, Ulness and the students published a peer-reviewed article about carbon nanotubes in a scientific journal.

Burghaus' most recent educational project is developing a class about surface science, nanoscience and materials, which will be offered by NDSU Distance and Continuing Education. The class was offered during Spring 2009 – 10 and was open for undergraduates, graduates and senior colleagues.

The foundation's Faculty Early Career Development Program recognizes and supports the early career development of faculty who show remarkable potential to become academic leaders. CAREER awardees are selected on the basis of creative, integrative and effective research and education development plans.

# Schroer named pre-medicine adviser


Julie Schroer

Julie Schroer wants pre-professional students to know that she is there to help. Schroer, adviser and lecturer of biological sciences, has been named the adviser for students in pre-medicine areas of study.

She assists students in such things as their course planning and gathering information on admission requirements for specific professional schools they are considering following their graduation from NDSU.

"First and foremost, I meet with students. I find the answers to pretty much anything they have questions about, because it's important they know what they are getting into," said Schroer, who joined the NDSU faculty this fall after teaching at Bismarck State College for 10 years.

The students she advises usually come from the four major fields of pre-medicine, pre-dental, pre-chiropractic or pre-optometry. But, Schroer said she also has met with students who are in pre-physical therapy and, in one case, pre-mortuary science.

Schroer said NDSU does not have a specific pre-med or pre-dental major, so she acts much like "information central" for NDSU students preparing for furthering their education in the medical field. Her biggest difficulty so far has been identifying those students who need assistance.

"I'm trying to get the word out, getting the students to know that I am here to answer questions and provide information," Schroer explained, noting she also plans to begin tracking the progress of NDSU's pre-med students, discovering things like how many students are accepted for professional programs versus how many apply.

In addition, she hopes to build a network of area medical professionals, allowing students to participate in volunteer experiences in their fields of interest.

A native of Perham, Minn., Schroer earned her bachelor's degree at the University of Minnesota-Morris and her master's degree in botany from NDSU. She also is co-owner of a greenhouse called Jean's – The Right Plant Place in Perham, Minn.

Schroer can be reached at 1-9789 or julie.schroer@ndsu.edu.

## Erin Gillam
### Assistant professor of biological sciences

**Education:** bachelor's degree from University of Maryland, College Park; doctorate from University of Tennessee, Knoxville

**Activities:** member of Animal Behavior Society and North American Society for Bat Research

**Previous experience:** postdoctoral researcher at University of Regina, Saskatchewan, Canada

**NDSU objective:** research focuses on the behavioral ecology of bats. She also is interested in the ecological and evolutionary basis of behavior in all animal groups. She studies how behavioral, ecological and evolutionary factors influence the structure of animal communication signals. Is a major proponent of conducting experimental research in a field setting, as such studies provide robust information about the behavior of animals in their natural environment.

## Kathryn Gordon
### Assistant professor of psychology

**Education:** bachelor's of psychology and master's and doctoral degrees in clinical psychology from Florida State University, Tallahassee

**Activities:** teaches abnormal psychology course and advanced psychopathology course; clinical supervision of clinical psychology graduate students; provides research experience for undergraduates

**Previous experience:** graduated in August 2008. The assistant professor position at North Dakota State University is her first position following graduation.

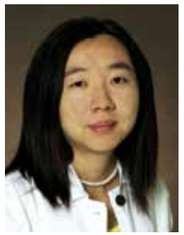
**NDSU objective:** establish a productive and meaningful program of research that illuminates causes of suicidal behavior and eating disorders.

## Stuart Haring
### Assistant professor of chemistry and molecular biology

**Education:** bachelor's degree from University of North Dakota, Grand Forks; doctorate in biology from University of Iowa, Iowa City; postdoctoral fellow in biochemistry at University of Iowa

**Previous experience:** previous research and teaching interests were in molecular and cellular biology and genetics. His postdoctoral work centered on understanding a protein complex that participates in different DNA processes essential for cell growth and survival.

**NDSU objective:** provide instruction to students about the importance of DNA and how DNA can be used and manipulated in our society to solve everyday problems. His research objective is to identify and understand how factors that affect DNA processes can contribute to cellular defects and disease.



## Wei Jin
### Assistant professor of computer science

**Education:** earned bachelor's from University of Science and Technology, Beijing; M.E. from the Computing Institute of Technology, Chinese Academy of Sciences; master's and doctorate in computer science from State University of New York, Buffalo

**Previous experience:** was a teaching/research assistant for five years in the Computer Science and Engineering Department at State University of New York at Buffalo. She also has two-years' industry working experience in software engineering and testing. She has been conducting research in the area of data mining and knowledge discovery, information retrieval and extraction, and social network analysis.

**NDSU objective:** excellence in research and undergraduate and graduate teaching, grant proposal writing and application

## Mila Kryjevskaia
### Assistant professor of physics

**Education:** doctorate in physics from University of Washington, Seattle

**Activities:** teach physics courses and conduct research that focuses on how students learn physics. The objective is to conduct an investigation that allows for identification of conceptual and reasoning difficulties that students encounter in studying physics. The results of this investigation then inform the development of instructional strategies designed to address specific student difficulties identified by research.

**NDSU objective:** continue conducting research on student understanding of physics concepts; engage and supervise undergraduate and graduate students in this type of research.

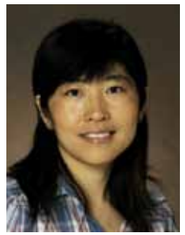
## Adam Lewis
### Assistant professor of geosciences

**Education:** bachelor's from Idaho State University, Pocatello; master's in quaternary geology from University of Maine, Orono; doctorate in earth sciences from Boston University.

**Activities:** research centers on the role of Antarctica and its ice sheets in Earth's climate evolution. He has spent nine austral summers working from remote tent camps along the ice sheet margin.

**Previous experience:** postdoctoral fellowship at the Byrd Polar Research Center at The Ohio State University, Columbus. A National Science Foundation-funded postdoctoral fellowship followed.

**NDSU objective:** continue paleoclimate research using both glacial geologic and biological indicators of climate change; introduce as many graduate and undergraduate students as possible to field research.



## Juan Li
### Assistant professor in computer science

**Education:** earned bachelor's from Northern Jiaotong University, Beijing; master's in computer science from Chinese Academy of Sciences, Beijing; doctorate in computer science from University of British Colombia, Vancouver, Canada

**Activities:** research interests are in distributed systems, especially P2P network and distributed search.

**Previous experience:** reviews several conferences and journals, published more than 20 papers in various areas of distributed systems. Worked as a software engineer for Sinosoft in Beijing.

**NDSU objective:** to establish herself as a successful researcher in the field of distributed systems and an ideal teacher and educator to guide undergraduate and graduate students.

## Erika Offerdahl
### Assistant professor of chemistry and molecular biology

**Education:** bachelor of arts and bachelor of science from Montana State University, Bozeman; doctorate in biochemistry from University of Arizona, Tucson

**Previous experience:** research on teacher cognition in higher education, faculty professional pedagogical beliefs and practices, and students' pre-instructional beliefs. Other involvement includes the Science & Mathematics Education Center (SAMEC), the National Science Foundation GK-12 fellowship program and the Life and Planets Astrobiology Center at the University of Arizona's NASA Astrobiology Institute.

**NDSU objective:** research centered on three areas: assessment for understanding, undergraduate student learning in biochemistry, and science faculty and graduate teaching assistants' pedagogical beliefs. Will also support the new STEM Education Ph.D. program at NDSU.

## Katie Reindl
### Assistant professor of biological sciences

**Education:** earned bachelor's degree at University of Minnesota, Morris; doctorate in pharmaceutical sciences at NDSU

**Previous experience:** received additional training in a postdoctoral position with the Department of Biological Sciences at NDSU.

**NDSU objective:** research interests are in cancer cell proliferation, motility and survival.

# Biological Sciences

## Students gain experience in Yellowstone research

This October, students in environmental science will have an opportunity to be involved in a four-day field experience at Yellowstone National Park investigating reintroduction of the gray wolf. All students in the class of more than 300 can submit questions for the participating team to investigate. Eleven of those students will accompany assistant professor Gerald Ketterling to the park. They will talk with researchers, observe wolves, make observations on how the park has changed, and talk with ranchers to get a complete picture of the complex issue. Students will give a multi-media presentation to the class when they return. This project is the result of a professional development grant to Ketterling to seek ways to engage students in real world issues and research while enrolled in a large lecture class.

Assistant professor Lisa Montplaisir is principal investigator on a $743,516 award from the National Science Foundation. The Robert Noyce Scholarship Program was created to enhance the quantity and quality of secondary science and mathematics teachers across North Dakota and adjacent states. Recruitment of talented Science, Technology, Engineering and Math (STEM) students into a quality teacher preparation program will improve student achievement in classrooms and increase the likelihood for successful matriculation of high school students into STEM programs in college. NDSU's program has two components: 1) STEM scholars receive $12,000 awards to enroll in dual majors leading to teacher certification with commitment to teaching two years in a high needs school, and 2) STEM internships available to first and second year college students for six weeks of summer funding for a research experience. Information on the program is available at www.ndsu.edu/csme/noyce. Co-principal investigators are assistant professor Angela Hodge, associate professor Canan Bilen-Green, assistant professor Erika Offerdahl, assistant professor Gerald Ketterling, professor Donald Schwert, professor Dogan Comez, and professor William Martin.

# Chemistry and Molecular Biology

## Labs renovated and faculty added

Several new personnel were hired, and multiple ongoing faculty searches were completed. We welcomed two new tenure-track faculty to our department: Stuart Haring, assistant professor, specializes in the molecular biology of DNA metabolism and cell cycle regulation; and Erika Offerdahl, assistant professor, specializes in chemistry and biochemistry education. Two staff scientists also were welcomed: Raj Murthy, director of the Core Synthesis Laboratory; and Jodi Haring, director of the Core Biology Laboratory. Both laboratories are funded by our NIH-funded Center for Protease Research and provide common instrumentation and training for users at NDSU.

Renovation of our teaching facilities continues. Ladd 309, one of three general chemistry teaching laboratories, was renovated in spring and summer of 2008 and re-opened in fall 2008. This room is primarily used for Chem 122L and some Chem 121L laboratory sections. Replacement of deteriorating bench work, floors and plumbing provide an improved and modernized work area for students. An improved bench layout and relocation of the glass shop to a nearby room resulted in a substantial increase in enrollment capacity for laboratory sections held in this room. We now serve more than 1,000 students in general chemistry laboratories each fall semester, and more than 600 each spring.

# Coatings and Polymeric Materials

## Big awards earned at coatings conference

Many of our students and faculty attended the principal North American coatings conference, FutureCoat! 2008, in Chicago. We maintained our prior success rate by winning a significant fraction of the awards for papers and presentations. Faculty and students won the Roon Award for papers and also fared well in other categories. Our graduate students dominated the poster session awards by winning first place in the undergraduate/master/young Ph.D. section and all the awards in the senior Ph.D./post-doc level.

Professor Gordon Bierwagen served on a National Research Council committee that produced a report on the state of corrosion education. The principal recommendations were that corrosion science should be more widely taught and the government should provide resources to universities to accomplish this. Since the department already teaches corrosion science, we anticipate increased interest in our offerings.

Not only does the department operate a North Dakota Center of Excellence to promote industry and jobs in North Dakota by helping companies here, but also we seem to be regaining more general industrial collaborations, particularly with our new faculty. Assistant professor Victoria Gelling recently started a project with Toyota and another with PPG. Assistant professor Andrej Voronov anticipates successful negotiations over intellectual property with a European company and that the project will start soon.

The first college Science Café was presented in February 2008 with help of the local American Chemical Society chapter. Howard Killilea of Valspar gave a presentation on paint at a large local hardware store that was well attended. This initiative will be the subject of an article in Chemical & Engineering News, the national weekly journal of the American Chemical Society.

We were sad to learn that Lowell Wood, long-time supporter of our department, died at the age of 94. He funded a scholarship in the department and recently was very active in the our Industrial Advisory Board. We often met him at Education Night of the Northwest Society for Coatings Technology in Minneapolis, where he had been vice president for Frost Paint and Oil Corporation.

# Computer Science

## Large grant awarded in computer science

It has been a year of minor growth and consolidation for our department, with potential for future increases from a number of sources. It also has been a "year of assessment" as the department simultaneously underwent annual assessment, program review and accreditation self-study—the rare trifecta.

Assistant professor Anne Denton and plant science associate professor Shahryar Kianian recently have been awarded a $3.1 million National Science Foundation grant for wheat genome research, among the largest grants won by a computer science faculty member.

Two new faculty joined us at the beginning of the academic year. Assistant professor Juan Li from the University of British Columbia specializes in distributed systems, semantic Web technologies, information retrieval and knowledge discovery. Assistant professor Wei Jin from the State University of New York, Buffalo, specializes in data mining, information retrieval, machine learning and bioinformatics.

Three graduate students were awarded North Dakota Space Grant Consortium research assistantships in September. Later that month, former astronaut Col. Al Worden from the Apollo 15 moon mission visited NDSU. He met with students and their advisers to shake hands and pose for photos.

Assistant professor Yan Gu left NDSU to take a position at Auburn University.

Professor Kendall Nygard traveled to China in November and met with university officials at several institutions to discuss a new twinning agreement. Assistant professor Dianxiang Xu also visited China in January as part of a joint NDSU and Campus Development Group delegation to plan for a Fergus Falls development in 2010.

# Geosciences

## Film debuts and activities increase

Assistant professor Adam Lewis joined our faculty this year. Lewis, an outstanding teacher and researcher of glacial geology and long-term climate change, and distinguished professor Allan Ashworth completed another successful Antarctic expedition in 2008. Undergraduate Spencer Salmon was part of that trip. Ashworth and Lewis were featured in a film, "Ice People," directed by an Emmy Award-winning producer (www.icepeople.com). The film was shown to a large audience, including numerous alumni, on opening night of the Fargo Film Festival.

Our student numbers continue to grow, and senior lecturer Elaine Hatzenbuhler has her hands full with intro labs. The department complexion is changing with more emphasis on graduate study. Assistant professor Ken Lepper and assistant professor Peter Oduor have each shepherded two graduate students through their labs, with more on the way. Associate professor and chair Bernhardt Saini-Eidukat is involved in collaborative research on the origin of naturally high levels of heavy metals in North Dakota soils. And we recognize professor Don Schwert's indelible imprint on so many students and colleagues during the years as he transitions to a more permanent administrative role at the university. Visit our Web site at www.ndsu.edu/geosci.

# Mathematics

## Grants awarded to assistant professors

Assistant professor Marian Bocea was awarded a three-year research grant in applied mathematics from the National Science Foundation that will support his work between 2008 and 2011. Assistant professor Sean Sather-Wagstaff received a two-year research grant in homological algebra from the National Security Agency from January 2009 until 2011.

The department hosted an undergraduate mathematics conference on April 24. Doug Anderson, Concordia College, Moorhead, Minn., and Scott Chapman, Trinity University, San Antonio, were the guest speakers.

Azer Akhmedov and Robert Hladky will join the department in tenure-track positions. Akhmedov is a visiting professor at NDSU from the University of California, Santa Barbara, and Hladky is currently at the University of Rochester, N.Y.

# Psychology

## Clinical psychologists join department

The Department of Psychology welcomes two new faces to the faculty. Assistant professor Kathryn Gordon earned her Ph.D. from Florida State University, Tallahassee, in 2008. She is a clinical psychologist specializing in eating disorders and suicidal behavior. Keith Donohue is also a clinical psychologist from Florida State. He teaches clinically related courses and is working on his dissertation. His research examines the influence of alcohol intoxication on emotions and attention. Professor James Council is back in the department after spending a couple of years as dean of libraries.

Despite difficult economic times, students in our program have benefitted tremendously from the generosity of friends and alumni. Recent donations to the Department Research Fund have supported two incoming freshmen. Mary Morth, Wheaton, Minn., and Leah Beekman, Eagan, Minn., were awarded $1,000 research fellowships to get them involved in the laboratory early in their college studies. Erin Doerner and Konrad Bresin were named the E.V. Estensen outstanding psychology majors. Each received a monetary award and their names were engraved on a permanent recognition plaque in the department. They both plan to attend graduate school in psychology. New endowments to benefit student research and travel were named in honor of William Beatty and Kevin and Harriette McCaul. Thanks to everyone for being so generous with your support.

# Statistics

## Students conduct sports research

The department is considering an option with emphasis on sports and recreational statistics. Several undergraduate and graduate students have expressed interest in this area over the years. Students and their advisers have written papers or presented talks in statistics related to a variety of sports and games. Associate professor Jeff Terpstra and alumnus Nick Schauer, BS '01, MS '04, wrote a paper on predicting track and field world records that appeared in 2007. Schauer was also a member of the NDSU track team. Tharemy Hopkins, BS '08, and professor and chair Rhonda Magel, wrote a paper on slugging percentages in differing baseball counts. Both papers appeared in the Journal of Quantitative Analysis in Sports.

Two of our alumni conducted research in the area of football. Michael Burak, MS '08, wrote his thesis on "A Strategy for Drafting Players for a Fantasy Football Roster." Geoffrey Childress, BS '07, is working on a model to estimate the probability of a professional football team winning the game based on the turnover margin. Magel was adviser for both students.

John DeHaan, MS '05, conducted research on the statistical analysis of golf course ratings. Both professor emeritus M.B. Rao and Magel served as his advisers.

David Richardson, BS '08, conducted research as part of his capstone project on the amount of money spent for each team roster versus their record of wins and losses. His research included football, baseball, basketball and hockey. Magel served as his adviser.

Current student Casey Jones is doing his capstone project on estimating the probability of winning given certain conditions in a Pinochle game. Jones plans to graduate in May 2009. Magel served as his capstone adviser while Jones taught her about Pinochle.

These students represent some of the students in the past few years who have been interested in and conducted research related to sports or recreation. Other students in the past also conducted research in this area.

# Physics

## Long-time faculty member retires

Associate professor Charles Sawicki will be retiring in August 2009. He has been on the physics faculty for 30 years and has served the department in just about every capacity. Sawicki has always been here for us, and we will miss him. He won't stop being involved in physics, however. This summer he will be doing science education outreach at Yunker Farm. He will conduct a Kidcology session in June, and install two new hands-on demonstrations about the physics of hybrid cars and diamagnetic levitation.

As a result of President Joseph A. Chapman's initiative to introduce a doctoral program in STEM-Education, a new faculty member has joined our department. Assistant professor Mila Kryjevskaia earned her Ph.D. in physics education at the University of Washington, Seattle. Mila's husband, NDSU research assistant professor Andrei Kryjevski, is a theoretical physicist working on a number of problems involving Strongly Interacting FermiSystems. Our physics education program will be even stronger next year with the recent hire of Warren Christensen. He earned his Ph.D. at Iowa State, Ames, and is currently a research associate at the University of Maine, Orono.

Assistant professor Terry Pilling, who had been with the department for more than four years, has taken the position of vice president of operations and technology at Crownbutte Wind Power in Mandan, N.D.

Finally, associate professor Sylvio May received our college's Outstanding Research Award last spring, an exceptional honor so early in his career.



# 2008-2009 SCHOLARSHIP AWARDS

*All are from North Dakota, unless indicated.*

### COLLEGE-WIDE SCHOLARSHIPS

**Fred A. Bristol, Jr. Scholarship***
Erich Wilkerson, Clear Lake, Minn.

**Dean's Scholarship**
Leah Beekman, Eagan, Minn.
Jarrett Hart, Delano, Minn.
Derek Miller, Bismarck, N.D.

**Allan G. Fischer Governor's School Scholarship in Laboratory Science**
Rupa Patel, Dickinson, N.D.

**Governor's School Scholarship in Mathematics**
Michaela Groninger, Douglas, N.D.

**Graduate School Research Award**
Darci Block, Fargo, N.D.

**Graduate School Teaching Award**
Bethany Kubik, Warba, Minn.

**Duane E. Hinsz Scholarship in Mathematics Teaching***
Chelsea Hageman, Lisbon, N.D.

**Harvey L. Hinsz Scholarship in Science Teaching***
Michael Kaiser, Ellendale, N.D.

**McCarthy Science Teacher Education Scholarship***
Bridget Kilen, New Salem, N.D.

**Lucille McMahon Heggeness Memorial Scholarship***
Matthew Anderson, Moorhead, Minn.
Casey Johnson, Bovey, Minn.
Natalie Verworn, Warroad, Minn.

**William McMahon Memorial Scholarship***
Sarah Isaak, Jamestown, N.D.
Bridget Kilen, New Salem, N.D.

**Ralph L. Pitman Memorial Award***
Amanda Benz, Mounds View, Minn.

**Steinhaus-Rhinehart Scholarship***
Heather Bergan, Bismarck, N.D.

### Biological Sciences

**Gary K. Clambey Scholarship***
Tracy Clapper, Bowman, N.D.

**Robert H. Levis II Cross Ranch Fellowship**
Kelsey Dunnell, Harwood, N.D.
Benjamin Geaumont, Hillsboro, N.D.
Sharmila Sunwar, Nepal

**Innovis Health Pre-medicine Scholarship***
Nicholas Galt, Carrington, N.D.

**Sheila Kath Award***
Shannon Gaukler, Fargo, N.D.
Michelle Petersen, Sioux Falls, S.D.

**G. Arthur Larson Scholarship***
Lana Christine Erickson, Columbus, N.D.

**Oliver LaVoy Memorial Scholarship***
William Clark, Ellensburg, Wash.

**Harvey K. Nelson Scholarship***
Daniel McEwen, Moorhead, Minn.

**Outstanding Biological Sciences Education Senior Award**
Naomi Harr, Mandan, N.D.

**Outstanding Biology Student Award**
*Freshman Award*
Nathan Braun, Bismarck, N.D.
Patricia Bailey Maher, Fargo, N.D.
*Sophomore Award*
Marie Natalie Gilles, Glyndon, Minn.
*Junior Award*
Victor Schuring, Andover, S.D.

**Outstanding Botany Student Award**
*Freshman Award*
Ryan Sterns, Valley City N.D.

**Outstanding M.S. Student Award**
Laurel Moulton, Austin, Texas

**Outstanding Ph.D. Student Award**
Sujan Henkanaththegedara, Dehiwala, Sri Lanka

**Outstanding Undergraduate Research Student Award**
Nicholas Galt, Carrington, N.D.
Michelle Gastecki, Wadena, Minn.
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**Greetings from North Dakota State University!**

Today NDSU is larger and stronger than ever before. Our growth is due to the talent and dedication of our staff, faculty, students, alumni and friends. Our faculty and staff continue to provide top-quality service and education to our students who in turn receive a great education. While attending NDSU, students participate in research projects, join student government and volunteer in the community. Did you know that thousands of volunteer hours are donated to the Fargo-Moorhead area and surrounding communities every year?

After graduation, these same students become our alumni and they go on to become active in their community and place of work. With a graduation placement rate of more than 98 percent, we know that our graduates are in high demand.

I encourage you to come back to campus for a visit. The 2009 Homecoming is set for the week of Sept. 28 through Oct. 3. It is a week full of activities. Whether you attend a fine arts event, a faculty lecture, or cheer for the Bison in the football stands, I hope you will continue your involvement with NDSU.

It is an exciting time at NDSU. Stop by the dean's office next time you are on campus. I'd welcome the opportunity to give you a guided tour and share a cup of coffee.

Have a great year!

*– Keri Drinka*

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